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DEALER GETS VERDICT IN COURT TEST ON AIR CONDITIONING 'PERFORMANCE'

Miller To Head Merchandising Service For G-E

Will Coordinate Dealer Activities In Sales And Advertising

CLEVELAND—L. H. (Lou) Miller has been appointed manager of merchandising services in the specialty appliance division of General Electric. He previously had been sales manager of the domestic refrigeration section.

In his new post, he will devote his time to effecting a correlation of merchandising activities, including advertising and sales promotion, sales training, dealer displays, utility-service and home-service functions.

Before coming to Cleveland as domestic refrigeration sales manager, Mr. Miller had established a reputation for taking over weak distributorships and turning them into profit makers.

He signed as the first G-E distributor in Kentucky in 1925. Hit by the closing of the Bank of Kentucky in 1930, the business was sold to the Thompson-Sterling Co., and later was taken over by G-E Supply Corp.

Mr. Miller then came to Cleveland as general sales manager of Electrical Housekeeping in 1934, and later was transferred to Keystone Appliances at Harrisburg, Pa. He stayed there until Oct. 1, 1936, when he was chosen to manage the new Allentown, Pa. district when it was formed.

Under the new coordinated program of merchandising services in the division, Jean DeJen is manager of dealer development service. In this position, he will continue his work with the Sales Counselors Club, and will devote his efforts toward improved dealer relationship in general, including dealer product display and advertising.

Maytag Loses Patent Infringement Suit

WASHINGTON, D. C.—The U. S. Supreme Court last week ruled against Maytag Co. in its patent infringement action against Easy Washing Machine Co. and Hurley Machine Co., and at the same time again rebuffed the Maytag claims by awarding General Electric Co. the decision in its appeal from a patent infringement suit brought against it by the Maytag company.

These suits were argued jointly before the court, inasmuch as both concerned claims on Patent No. 1,866,779, issued July 12, 1932 with Maytag Co. as assignee. Thirty-nine

(*Concluded on Page 3, Column 4*)

Patent on Double-Vane Outlets Held Invalid

CHICAGO—The Feinberg et al patent No. 1,601,815 issued Oct. 5, 1926 covering use of the double vane air outlets, employing horizontal and vertical vanes one behind the other, was held invalid in a decision made by Federal Judge Barnes of the United States District Court, the culmination of a suit tried here May 16-18.

The suit was brought by United States Air Conditioning Corp., against Carrier Engineering Corp., Carrier Corp., Carrier Construction Corp. of Illinois, and Air Comfort Corp.

The patent was alleged to cover

(*Concluded on Page 3, Column 2*)

Engineers 'Told Off' On Shortcomings of Air Conditioning

HERSHEY, Pa.—The air-conditioning industry got a straight-from-the-shoulder lecture on some of its shortcomings at the American Society of Refrigerating Engineers' spring meeting here last week when Charles A. Peters of the U. S. Department of the Interior's division of public building management spoke on problems in the operation of the air-conditioning equipment in government buildings in Washington, D. C.

One of Mr. Peters' most jolting revelations was that the Department of the Interior had worked out a program this year for air conditioning the eight principal government buildings in the capital not now air conditioned, but that this had been turned down by the House of Representatives appropriations committee because of the "personal observations and experiences in connection with air conditioning—."

Main general criticism of the equipment drawn out of Mr. Peters

(*Concluded on Page 17, Column 1*)

Additional Equipment Standards Approved At R.M.A. Meeting

HOT SPRINGS, Va.—Refrigerating machinery standards supplementing the equipment standards published in 1938 were approved by Refrigerating Machinery Association members at their annual meeting here.

Under the title, "Equipment Standards Supplement 'A'", this 14-page addition lists its contents under such major headlings as:

Base specifications for self-contained ammonia units.

Ammonia brine cooler ratings—showing basic heat transfer curves as a function of brine velocity, mean temperature difference, brine temperature, and brine concentration. A tabulation of the properties of calcium chloride brine and other general information are included.

"Freon-12" mains—showing ton-

(*Concluded on Page 3, Column 2*)

A.S.H.V.E. To Hear Data On 'Comfort Studies'

MACKINAC ISLAND, Mich. — "Comfort Studies" at the Federal Reserve Building, Washington, D. C., and at the Metropolitan Life Insurance Building, New York City, will be reported at the summer meeting of the American Society of Heating & Ventilating Engineers here July 4 to 6.

F. C. Houghten will present data on the Washington building and Dr. W. J. McConnell will describe findings at the Metropolitan offices. Both papers are to be presented during final sessions of the three-day meeting.

Other papers closely associated with current air-conditioning problems will be "Performance of Cooling Towers," by B. M. Woods and L. M. K. Boelter, and "Fire Protection for Air-Conditioning Systems," by R. C. Loughead.

Heating of low-cost homes, solid fuel water heaters, improvements in heating equipment, air inlets and outlets on convectors, and the transfer of vapor through materials also will be studied at technical sessions.

First day of the program will be devoted to registration and sports, and the semi-annual banquet and dance will be held the evening of July 5.

Industry Is Life Blood of Land, Shipley Asserts

Cooperation of Government Urged In Address Before ASRE

By George F. Taubeneck

HERSHEY, Pa. — Turning aside from consideration of such advanced technical problems as portable calorimeters, brewery fermentation, thermodynamic properties of methyl chloride, and refrigerated transportation, members of the A.S.R.E. in convention assembled here May 23 heard President W. S. Shipley of York Ice Machinery Corp. make a masterly presentation of the contribution of American industry to our high standard of living.

"For the past six years," he began, "industry has been the subject of attack by some of the people of our nation. They seem to have forgotten that industry is the economic foundation and life blood of the nation.

"They seem to have forgotten the large part industry has played in the development of the American nation. They seem to have forgotten the material aid industry has rendered in making the United States of America, as Abraham Lincoln said, truly a 'government of the people, by the people and for the people.'

"They seem to have forgotten that if we, as a nation, are to continue

(*Concluded on Page 2, Column 4*)

Business Highlights of The A.S.R.E. Meeting

Next annual meeting of the A.S.R.E. is definitely scheduled for the week of Jan. 15, 1940, during which week the Second Annual All-Industry Refrigeration & Air Conditioning Exhibition will be held. Meetings and dinner dance will be at the Blackstone hotel, Chicago.

Membership in the society will henceforth be of two grades, instead of four, as heretofore. The two grades will be "member" with annual dues of $17.50 per year; and "associate member" with dues of $7.50 per year.

A charter was granted for a new Baltimore-Washington section of the society.

Dealers Asked To Write Congressmen To Drop Refrigerator Tax

WASHINGTON, D. C.—Hope that Congress may allow the present 5% excise tax on household mechanical refrigerators to lapse June 30 is now being expressed in some informed quarters here.

Secretary of the Treasury Morgenthau has just declared that "we should endeavor to minimize the use of the manufacturers' excises and other commodity taxes which tend to be shifted directly to consumers."

Major manufacturers have declared that if this tax is allowed to lapse, an immediate reduction of 5% in the retail price of household refrigerators will go into effect, thus stimulating business all down the line.

Dealers are being encouraged to write to their Congressmen on this subject, and especially to the members of the Subcommittee on Taxes of the House Ways and Means Committee.

These Congressmen include: Jare Cooper, Tennessee, chairman; John W. McCormack, Massachusetts; John W. Boehne, Indiana; Wesley E. Disney, Oklahoma; Frank H. Buck, California; Richard M. Duncan, Missouri; Allen T. Treadway, Massachusetts; Frank Crowther, New York; Daniel A. Reed, New York; Roy O. Woodruff, Michigan.

Longer Terms Will Lead To More Repossessions, N.R.D.G.A. Told

CLEVELAND — The longer the instalment terms, the greater the danger of repossession, C. W. Harvey, credit manager of Gilchrist Co., Boston, told members of the credit management division of National Retail Dry Goods Association at their sixth annual meeting.

"Terms which do not mortgage a person's income beyond a reasonable time are really best for the customer, as well as for the store," Mr. Harvey said.

"Most repossessions are the result of people overloading themselves, and then finding themselves unable to meet the instalment payments, and the longer the terms, the greater that danger of loss to the individual from misfortune, sickness, and unemployment."

A survey by one of the leading finance companies covering electrical

(*Concluded on Page 2, Column 1*)

Special Radio Broadcast and Ceremonies Mark Opening of New Ochiltree Headquarters

PITTSBURGH—New quarters of Ochiltree Electric Co., General Electric appliance distributor in western Pennsylvania, eastern Ohio, and northern West Virginia, were formally opened here recently in the presence of G-E officials, executives of the Pennsylvania railroad, and several representative Pittsburgh business men.

Opening ceremonies consisted of sponsored tours of inspection, a special broadcast over radio station KDKA, and a luncheon at the Duquesne Club. Speakers at the luncheon were "Rosey" Rowswell, Pittsburgh radio man who conducted the broadcast, C. I. Leiper, chief engineer of the Pennsylvania railroad, Charles E. Wilson, executive vice president of General Electric, and W. H. Ochiltree.

New home of the distributorship is a reconstructed building situated in the Duquesne freight yards at 101 Penn Ave., and offers excellent facilities for distribution and display. Located on the edge of the city, yet close to the Golden Triangle, it is within easy reach of dealers and their delivery and pickup trucks.

Two buildings, with a total of 38,000 sq. ft. of floor space, are occupied by the distributorship. Between the two runs a spur track of the railroad. The structure closest to Penn Ave. houses offices, display rooms, and service centers; the other is used for warehousing and storage.

Shipping and receiving facilities, parts, service, and reconditioning rooms are separated into complete units which do not conflict with each other. Equipment is provided for refinishing refrigerators as well as for mechanical service.

A special radio service room, with its own entrance, is completely equipped with testing apparatus. A single section is devoted to storage and handling of sales promotional material and displays, items which

(*Concluded on Page 2, Column 3*)

Counterclaim Is Upheld, Damage Claims Rejected

Rulings From Bench On Evidence May Set Precedents

By Phil B. Redeker

NEWARK, N. J. — A sweeping victory was gained for the air-conditioning dealer in one of the first tests in the courts of a customer's "dissatisfaction" with his air-conditioning system, in the verdict delivered last Friday night by a jury which declared that the owner of a bar and grill here had "no cause of action" in his $150,000 damage suit against the Krich-Radisco Co., Kelvinator distributor, and in turn awarded the Krich-Radisco Co. the sum of $7,537 in its counterclaim for the unpaid balance of a contract for a 70-ton system which the distributor had installed in May, 1938.

IMPORTANT TEST CASE

This court battle, which lasted nearly two weeks, is seen as perhaps an important "test case" in the matter of possible litigation over the installation and performance of air-conditioning equipment. All the legal espects of the contract for the installation and performance of an air-conditioning system were thoroughly appraised, and Judge Joseph L. Smith, hearing the case on the bench of the Circuit Court of Essex County, made a number of rulings which may establish precedents in other similar cases that might possibly come to trial.

Dean Spaulding Frazer of Newark university's law school, counsel for the plaintiff (buyer), and Milton Unger, lawyer for the defendant, well-known civil law trial lawyer in this area and vice president of Newark university, made able presentation of their cases, calling in much expert testimony, having scale models of the ductwork exhibited, together with enlarged photographs of the actual installation.

BAR IS EXTENSIVE

Suit was brought by the 218-220 Market Street Corp. of Newark, which operates the Novelty Bar & Grill at that address. The Novelty Bar & Grill is an extensive and apparently heavily patronized establishment, consisting of two rooms; a front room containing a tremendously long bar (this section of the place is nearly 200 feet long, but narrow), a bottled liquor store, and some tables; the rear room, which is smaller, is the dining room. Proprietor is Jules Endler, who is said to have once been associated with the Florida enterprises of Jack Dempsey, former heavyweight boxing champion.

DESCRIPTION OF INSTALLATION

Described briefly, the installation consists of three 20-ton compressors, one 10-ton compressor, an evaporative condenser, and a duct system furnishing conditioned air to the premises through Anemostats, with the usual provisions for fresh air, air cleaning, thermostatic control, etc.

The plaintiff (buyer) sued for damages on five counts, alleging in his bill of complaints on these counts that—

(1) The defendant (installing firm) induced the buyer to purchase the installation through certain fraudulent representations, certain of them being that the defendant had the best engineers available for the job, that he had made proper studies

(*Continued on Page 8, Column 1*)

Kansas City Sales Rise Sharply

KANSAS CITY, Mo.—Household refrigerator sales in the greater Kansas City territory totaled 2,179 units during April, an increase of 46% over March and of 14½% over April of last year, when 1,714 units were sold.

April sales were 32½% under the mark for that month in 1937, when sales amounted to 3,222 units.

For the first four months of the year, refrigerator sales were up 20½% over their comparable 1938 totals, but still 30% below the same months of 1937. Sales through April this year amounted to 5,673 units, as compared with 4,705 in 1938 and 8,069 in 1937.

Kansas City's all-time sales high was hit in 1934, when 21,659 units were sold during the year. Second highest year was 1936, with sales of 17,526 units, and 1937 was third, with 17,127. Last year was the lowest since 1933, with sales of 10,779 units reported.

Three-year summary of Kansas City sales for the first four months of the year follows:

	1937	1938	1939
January	440	364	694
February	1,667	751	1,304
March	2,740	1,692	1,496
April	3,222	1,898	2,179
Total	8,069	4,705	5,673

Repossessions Increase With Longer Terms

(Concluded from Page 1, Column 4)

appliances during 1938 showed that for every 100 repossessions on transactions having terms 12 months or less there were:

162 on transactions running between 13 and 18 months.

291 on transactions running between 19 and 24 months.

389 on transactions running more than 24 months.

"In other words," Mr. Harvey pointed out, "repossesions on transactions running over 24 months were 289% more than those which ran only up to 12 months."

Ochiltree Employes In their New Home

Sales and office staff of Ochiltree Electric Co., veteran G-E distributor, here pose for the photographer in a wing of the company's 180-foot display room in its new headquarters. When it took on the G-E line in 1925, the company served only one county.

* * *

Clifford, Official of Cutler-Hammer, Dies

MILWAUKEE — William Clifford Stevens, longtime employe of Cutler-Hammer, Inc. and since 1930 vice president in charge of engineering, secretary, and a director of the company died here May 15 at the age of 55.

Mr. Stevens joined the Cutler-Hammer organization in 1906, following his graduation from Cornell university with a degree in mechanical engineering. He started in the engineering department at the company's headquarters here, but a year later was transferred to Pittsburgh.

From 1910 to 1912 he was associated with the sales department in Milwaukee, and in 1913 he was made district manager of the firm's western division, with headquarters in Chicago. A year later he became eastern district manager, with offices in New York City.

In 1917 he returned to Milwaukee to become general manager. In 1924 he was placed in charge of the development department, and continued in this capacity until he received the executive duties.

Ochiltree Opens New Display Room

(Concluded from Page 1, Column 4)

in many instances, it is felt, are rendered ineffective through lack of handling facilities.

Display room is 180 feet long, and is used to show off the distributorship's complete line, from vacuum cleaners to complete kitchens and commercial refrigeration equipment.

Lighting for the stock and display rooms was specially planned, illumination in the stock room featuring daylight fluorescent tubes.

From 1920 until its recent move, the Ochiltree organization had maintained headquarters in its establishment on Liberty Ave. here. The company assumed distribution of G-E refrigerators in 1925, adding other products gradually.

Tax Collections Down

WASHINGTON, D. C. — Down nearly 23% from the same month last year, excise tax collections on mechanical refrigerators during April totaled only $848,640, compared with $1,097,320 in April, 1938.

Industry Has Created 13,500,000 Jobs In 100 Years, Shipley Tells A.S.R.E.

(Concluded from Page 1, Column 3)

along the prosperous ways known before the depression, there must be wholehearted cooperation between government and industry.

"They seem to have forgotten that American industry was created by the American people and, in turn, industry has created for the people the highest standard of living in the history of the world."

Without industry we would all be engaged in the age-old sun-to-sun struggle for food, clothing, shelter, and fuel, he pointed out.

"Industry's main desire has been to produce more goods at lower cost so that more and more people might buy them, use them, and enjoy them," Mr. Shipley continued. "American life has for many years drawn its strength from industry and our very thoughts have come to revolve around industrial interests and industrial affairs.

BLAMED FOR DEPRESSION

"It seemed natural, therefore, when economic depression came upon us and 12 millions of men were unemployed, that we should hear from every side people asking themselves, 'what is wrong with industry, that this could happen? Why can't industry employ these 12 millions of men?'

"The truth of the matter is that less than one and one-half millions of the 12 millions out of work ever were employed in factories which the average man thinks of as industry. Yet many people claim that industry alone was responsible for the hard times, and should pay the full cost of relief through special taxation, and should find jobs for all the unemployed.

THE FACTS AND FIGURES

"Maybe this situation is industry's own fault, because industry's story is hard to tell except by facts and figures, and the average individual does not take kindly to such dry information.

"However, I should like to place before this assembly some of the true facts and figures in regard to industry, with the hope that you may spread this information in the highways and byways in an effort to put industry in the proper light before the people."

Mr. Shipley then recited the following statistics:

Industry has created, during the past 100 years, 13,500,000 new jobs.

During the past 50 years, industry has created 15 new massive industries giving work to a total of 1,500,000 people.

During the 50 years from 1879 to 1929, industry increased its payroll from 948 million to 11½ billions, or 12¼ times, while population increased only 2½ times.

National income during the 30-year period from 1899 to 1929 increased from 16 billion to 83 billions. Industry's share of this national income was 4 billions in 1899, and 19 billions in 1929.

SIX-YEAR RECORD

During the six-year period from 1930 to 1936, industry paid out in wages, dividends, materials, etc., 34½ billions more than it received.

He continued: "Now the question we, of the refrigerating industry, naturally ask ourselves, is 'what part did we play in the development set forth above?' This, I believe, can be illustrated by a review of the chocolate establishment here at Hershey.

"Yesterday, our members had an opportunity of visiting this plant and spent some time in the engine room. This engine room, to my way of thinking, is a practical exhibit of the progress made by our industry during the past 50 years.

1903 UNITS CUMBERSOME

"You saw in this engine room, two machines that had been installed in 1903 which were representative of the slow-speed type in vogue from 1890 on. You next saw a large vertical machine installed in 1914 which was representative of the beginning of an increased speed.

"There was also in this room a large horizontal machine installed in 1919 and operating at 135 r.p.m. This was an example of the speeding-up of the horizontal machine. You also saw a large duplex horizontal machine put in in 1925, operating at 180 r.p.m. Then there was an exhibit of the first development in high-speed enclosed machines in the form of a two-cylinder machine operating at 225 r.p.m. and installed in 1926.

IMPROVEMENT TO 1936

"Also that was a three-cylinder machine of the same type operating at 225 r.p.m., installed in 1936. Finally, you saw a small, compact four-cylinder machine operating at 300 r.p.m.

"These machines cover the whole field of activity from 1890 to 1938, and are representative of the developments during that period so far as large reciprocating refrigerating machines are concerned.

"In 1903 the Hershey Co. put in two single-acting machines each having two cylinders—12½ inch bore and 18 inch stroke, making four cylinders in total. These four cylinders gave a total tonnage of 80 tons and operated at 76 r.p.m. They had a total weight of 76,000 lbs., or 950 lbs. per ton of refrigeration.

PAY UP, PRICE DOWN

"Then, in 1938, this company put in a four-cylinder 14 inch bore x 13½ inch stroke, single-acting machine with a capacity of 300 tons and operating at 300 r.p.m. The weight of this machine is 28,000 lbs. or 93 lbs. per ton of refrigeration.

"If we take the weight per ton of refrigeration of the machine installed in 1903 as 100% and the cost of this machine as 100%, we find that the the weight per ton for a reciprocating machine has been reduced 90% during this period, and the cost

"Then when we realize that machinists wages during this same period have increased over three times, you will readily appreciate the advancement that we as an industry have made during 40 years.

"Just look at the record: We have been able to pay our mechanics three times what they received in 1903 and, at the same time, reduce the cost of our product to the consumer by 37½%."

Television May Change Retail Advertising, Baker Predicts

RYE, N. Y.—Possibility that television may revolutionize the entire retail advertising picture by bringing housewives a daily animated presentation of a store's wares in a fashion made possible by no other medium was voiced by Dr. W. R. G. Baker, head of General Electric's radio and television department, in a talk to members of the Association of National Advertisers.

Speculating purely as an engineer, Dr. Baker said that television should greatly increase telephone sales, and tend to eliminate the bargain-day rush that has so long been a feature of department store merchandising.

While television at present is largely an entertainment medium, its end result will be that of a peddler, he declared.

"In a few years from now, when television transmission facilities will have pretty well covered the country and television receivers will be standard equipment in millions of homes, instead of going to the motor shows to see the new models paraded and demonstrated, we will sit in our living room and see this done in a more convincing and dramatic fashion.

"Our wives and daughters will see the season's new hats and gowns paraded on live models, see cooking demonstrations, receive lessons in interior decorating and gardening, see all kinds of products and appliances in actual use, with conversation and action.

"Television seems a perfect medium for department store advertising, because the present effective range of a television receiver—40 miles—covers almost the exact buying area of a store. If a large store should put on a television program for two hours in the morning, it could present merchandise in a far more interesting fashion than would be possible in newspaper advertisements.

"The housewife could make notes on items by numbers and prices, telephone in her order, and escape the terrors of bargain rushes. Such a method of shopping might revolutionize the entire technique of retail merchandising, not only in department stores but in many other fields."

There are two main problems to which the answer has not yet been found in America, although it has to a large extent in London, according to Dr. Baker. The first is programs—their technique and who will pay for them. British progress during the past year has clearly indicated the path, he said, as interesting programs have been created at reasonable cost.

"Perhaps we confuse our thinking by contemplating 12 to 18 hours per day of service, as with radio, whereas a few hours a day, with proper preparation and timing, will probably be sufficient to satisfy the public demand.

"The second problem is receiver cost, and this has been answered in London by the introduction of the so-called thirty-pound receiver, which British manufacturers claim they can justify on a cost basis if they can obtain production of 10,000 of a type. These receivers do not provide the finest performance that can be made available—that falls in a higher price bracket. The equivalent of this London receiver for $150 will cost $200 to $250 in America, because of higher distribution costs, but even at this price a sizeable market is opened up immediately."

Radio Is Furniture, Court Rules

BIRMINGHAM, Ala.—A radio is an article of furniture, while electric, gas, or mechanical refrigerators, heaters, and stoves may not be, Circuit Judge J. Fritz Thompson has ruled.

The court held that attempts of the state to place a tax on furniture dealers selling radios are "arbitrary, abortive, and void." At the same time he held that the levy of a license tax upon persons engaged as dealers in refrigerators, heaters, and stoves was not double taxation, although the dealers may have paid a license for a general furniture business.

Additional Standards Approved By RMA

(Concluded from Page 1, Column 2)

nage allowance for various line sizes and operating conditions in "Freon-12" suction, discharge, and liquid lines. Other application data also is outlined.

Informative tables and charts are included to amplify the text of the various sections. Copies of the new standards are available at the Association's offices, Southern Building, Washington, D. C. Single copies are 25 cents each.

Air Outlet Not New, Court Rules In Patent Suit

(Concluded from Page 1, Column 1)

the use of a deflector or diffuser, where two series of vanes are employed in an outlet for introducing air into a room—one set being horizontal and the other vertical, with one set placed behind the other.

Plaintiff claimed that the Carrier adjustable type outlet infringed their patent, and asked for an injunction and damages.

The action was successfully defended, on the ground that there was no new invention in the Feinberg patent. It was shown that the same outlet was used in the same way as shown in the patent for many years prior to the date of the patent.

Sunbeam Constructing Addition To Plant

EVANSVILLE, Ind. — Sunbeam Electric Mfg. Co., maker of Coldspot refrigerators, is constructing a two-story addition to its plant here to house chemical and metallurgical laboratories.

The addition, 200 by 55 feet, will provide quarters for design engineers' offices on the second floor and be equipped with sufficient machinery to construct experimental cabinets without interrupting production in the main plant.

Washer Sales Continue Increase In April

CHICAGO — Household washer shipments reported by members of American Washer & Ironer Manufacturers Association showed an increase for the sixth consecutive month in April, being 22.11% over their marks for the month a year ago.

Ironer shipments during the month were up 27.23% over their comparable 1938 marks.

Following is a tabulated comparison of washer and ironer sales for April and the first third of the year:

	1939	1938
Washers, April	116,199	95,158
First four months.....	508,718	379,528
Ironers, April	9,047	7,111
First four months.....	36,878	37,628

Maytag Patent Invalid, Supreme Court Rules

(Concluded from Page 1, Column 1)

claims are included in this patent, 36 of which are for a washing machine and three for a method of washing fabrics.

The court's decision, which was delivered by Justice Roberts, was based on the contention that the entire patent had been made null and void by failure of the assignee to disclaim all three of the claims pertaining to washing methods. The company had disclaimed two of these claims after the Circuit Court of Appeals for the Second Circuit had held that they disclosed no novelty and therefore had refused certiorari. The third claim has been neither disclaimed nor made the basis of any suit.

A portion of the court's decision in regard to the Maytag cases follows:

"These are patent infringement suits in which certiorari was granted because of a conflict of decision. Apparatus claims 23, 26, and 29 of the Snyder patent, No. 1,886,779, which are here involved, have been held invalid in Second Circuit by reason of anticipation; and have been adjudged valid in Eighth Circuit. We need not resolve the conflict, since we are of opinion the patent is void for failure to disclaim claim 39.

"The patent, issued July 12, 1932, to Maytag Co., as assignee, contains 39 claims, 36 of which are for a washing machine and three (Nos. 1, 38, and 39) for a method of washing fabrics.

"In 1935 the company obtained a decree in a suit against Brooklyn Edison Co. for infringement of apparatus claims 23 and 26 and method claim 38. The Circuit Court of Appeals for the Second Circuit reversed as to all three claims, holding they did not disclose novelty. This court refused certiorari and the company promptly disclaimed two of the method claims, 1 and 38, but did not disclaim 39.

"In the instant cases, infringement of apparatus claims 23, 26, and 29 is charged, but claim 39 is not in suit, nor has it been made the basis of any suit.

"If claim 39 describes the same method as claim 38, it follows that failure to sue on 39, or to disclaim it along with 38, invalidates the patent."

Electrolux Production Increases 20%

EVANSVILLE, Ind.—An increase of between 15 and 20% in the past month in production of Electrolux refrigerators is reported by W. E. Baker, vice president in charge of production for Servel, Inc.

The entire plant is on full-time basis, with 3,400 workers employed and a large number of departments working overtime in order to keep up with the production schedule.

Southern Commercial Dealers Turn To Small Town Market To Augment City Sales

* * *

Believe High Sales Record of Past Two Years May Be Bettered During 1939

By Phil B. Redeker

Montgomery, Ala.

Not a metropolis, but a good sized bustling city is Alabama's state capital. Sales of commercial refrigeration equipment have been at a pretty high level in the past couple of years, and from available reports 1939 started off about as well as any year in history on commercial sales.

Sales Ahead of 1938, Teague Reports

Wholesaling of refrigeration parts and supplies is just one of the many divisions of the Teague Hardware Co.'s activities, one of the largest hardware firms in the south, but it has grown to such proportions that the department was moved to larger and more prominent quarters within the past year, in order to get more display and stocking space.

In the opinion of A. C. Bomar of Teague's refrigeration supplies department, both commercial refrigeration and air-conditioning sales for the first 3½ months of 1939 were well up over figures for the comparable 1938 period.

The company wholesales "Par" condensing units, and its own machine business has been very good, Mr. Bomar testified.

Some of the local service engineers and contractors, he said, work with a local manufacturer of commercial refrigerators, who sells his product in a rather limited geographical area. The service men sell and install these commercial refrigerators, together with the machines they buy from the jobber, not only in Montgomery, but in the smaller surrounding towns.

'Time Is Ripe For Sales In Small Towns'

Under the new managership of aggressive George B. Bagwell, the Kelvinator commercial refrigeration and air-conditioning department of the Montgomery Electric Co., electrical contracting firm, has cut itself a big piece of the business in these lines done in Montgomery during the first four months of the current year.

Mr. Bagwell estimates his dollar volume so far this year as being well over the $10,000 mark.

He lists the following jobs as being sold this year:

Two display cases in existing stores.

Five condensing units for typical commercial jobs; two to a new restaurant, another one to another new restaurant, and two to existing grocery stores.

A reach-in cooler to a restaurant.

A special florist refrigeration job for the Rosemont Gardens floral company.

An installation for a hospital located outside of Montgomery.

A near carload of "Blue Flash" beverage coolers to the Dr. Pepper Bottling Co.

A 10-ton air-conditioning installation, complete with evaporative condenser, to a restaurant.

A 5-ton year-around air-conditioning job for a bank in a small nearby town.

The florist job was the refrigeration of a storage cooler in a greenhouse, used primarily to hold plant bulbs at 40 to 44° F. The firm had previously tried to use ice, without very good results and at a cost of $1 per day. The new 1-hp. refrigeration unit is doing the job correctly, says Mr. Bagwell, and because of the particular rate schedule in which the company's power usage falls, is operating at practically no additional cost.

Mr. Bagwell believes that the time is now ripe to get a considerable amount of commercial refrigeration business out of the smaller towns and "crossroads" centers, but he also declares that to try to "canvass" for such business is a pretty expensive proposition, from the standpoint of traveling expenses, and the time wasted in traveling from one spot to another. Development of "bird-dogs" who will check in only such good leads as can be followed profitably, is the one way to get such business economically, he thinks.

The Montgomery Kelvinator dealer is enthusiastic about the self-contained "store conditioner" units, especially for his size of city. However, he thinks a 2-ton and a 5-ton unit in this style has more sales possibility than a 3-ton unit, now the more or less currently popular size.

Helpburn Men Work Large Territory

Distributor for Frigidaire covering a considerable chunk of territory is the Helpburn Co. None of the men in the refrigeration division were in town when we called, Thomas Weaver of the company explaining that the six men in the division are on the road almost continuously, working a territory that extends down to Pensacola, Fla.

In addition to the Frigidaire commercial refrigeration and Delco-Frigidaire air-conditioning lines, the firm also handles Bastian-Blessing soda fountain fixtures, and a complete line of butcher supplies. These lines, explains Mr. Weaver, gives the salesmen many opportunities on their travels throughout the territory.

Birmingham, Ala.

The "magic city," as the natives like to call Birmingham, seems to have something of a magic touch for the refrigeration industry, as there are a number of commercial dealers here who have had an enviable record over a period of years, and to whom 1939 has the appearance of being a banner year. One instance: Birmingham was the only city on the trip where we found a dealer who declared that he was getting too much business: another example, the Birmingham division of Frigidaire has been first to make its quota among the Frigidaire divisions for three consecutive months.

The one big black cloud on the commercial refrigeration horizon this year was the labor difficulties in the coal industry, and as this is being published the difficulties have been solved, and the Birmingham dealers should have a record-breaking year.

Sales Almost Too Good For Smith & Berry

The firm that is finding business almost too good is that of Smith & Berry, dealer for Frick equipment.

While most of the jobs they sell are in the industrial classification (dairies, ice cream plants, bottling plants, metals processing, etc.), they operate more like a fast-moving specialty selling organization than a contracting firm.

In fact, William V. Smith of the firm is somewhat famed through the business as the man who has made his hobby of photography into a very useful sales tool — in fact, Smith's photographs play a part in nearly all of the firm's sales procedure and sales promotion methods.

The story of just how Mr. Smith makes use of his pictures is one that needs be told in more detail, which will be done in a separate story.

He has a key thought that other amateur photographers who would make use of their hobby might well note: the pictures can be good (and Mr. Smith's are good, He being a winner of a national award for amateur photography), but they must have an informal or "non-professional" touch to get and maintain interest among prospects, he points out.

Smith & Berry are taking considerable pride this year in a covered cooling section they developed for bottling plants. The covered type of bottling plant lowside is said to be favored among southern bottlers, at least. The covering is of stainless steel.

50% of Flint's Sales Are Replacements

Despite the labor trouble which halted mine operations, the Flint Refrigeration Co., retail dealer on Frigidaire commercial refrigeration equipment, reports gain for the first quarter of the current year over the '38 figures, according to Mr. C. Adams of the firm. He states that at least 50% of their volume now is in the replacement of old mechanical systems.

The Flint Co. has recently installed what is apparently the first refrigerated locker storage plant to go in Alabama, at Trussville, not very far from Birmingham. The 115-locker plant is claimed to be a model installation for the smaller plant size and other dealers in Alabama are watching with interest the way in which this plant will go.

Another item that is somewhat unusual is prominent among the equipment which Flint sells—namely, industrial water coolers, with two or more bubblers on a cooler.

'Commercial Is Gone' For Appliance Dealer

One Birmingham dealer who didn't paint too rosy a picture of the commercial refrigeration business was Jack Evans Appliance Co., General Electric dealer, rated as having one of the best appliance operations in the city.

"In my opinion, the commercial refrigeration business is 'gone' for the typical appliance dealer," Mr. Evans declared.

"First reason is that as the business is done today, it builds up too much liability for the dealer for the amount of profit that there is in it.

"In the second place, there is too much 'direct' selling."

Mr. Evans will still "take orders" for commercial refrigeration, but he doesn't make much an effort to go out and solicit business.

Especially in the sale of water coolers to business and industry, he says, has the evil of "direct selling" been particularly noticeable in Birmingham. On one job, he declared, a bunch of water coolers were offered for about half of his cost.

Conditioning Business Helps New Outlet

Relatively new in the field is the Gulf-York Co., dealer for York air-conditioning and refrigeration products.

According to Mr. F. L. Hardy of the company, Gulf-York has concentrated on the air-conditioning market in its activities so far this year, and after a rather slow start has found things beginning to look up quite a bit. By the time we arrived in Birmingham the company had sold eight jobs, of various types, probably the most outstanding one of which is for a hospital in Greenville, Ala., in which six patient's rooms and two operating rooms are cooled.

This hospital installation is featured by a split system of ductwork, whereby the operating rooms are not conditioned until they are needed, in which case the ducts to the patient's rooms are closed off, and the full force of the conditioner directed to the operating room. The rooms are "pre-cooled" prior to the operation, Mr. Hardy pointing out that even in emergencies there is at least 20 minutes available for pre-cooling.

Sell When They Remodel, Is Shook-Fletcher Advice

R. P. Quinn of the air-conditioning department of Shook-Fletcher (a sizeable concern dealing in general mill and factory supplies) has a theory about the best time to sell air-conditioning, particularly the bigger ones, and it's simply—

"Remodeling time."

The trick, according to Mr. Quinn, is to get to the prospect when he is thinking about remodeling, and that, says the Carrier dealer, involves not any special trick or tricks, but just 'keeping one's nose into things" and making regular contacts with firms that ought to be getting ready to remodel.

Dodge reports, and other building activity information services? "They're good chiefly to check up on how efficient you've been in keeping your nose in the business," declares Mr. Quinn.

Sales In Small Towns Help Lancaster Co.

Dealer for McCray commercial refrigerators, the Lancaster Equipment Co. found business good in the latter part of March and the beginning of April, after a slow start early in the year.

A good share of the business has been obtained in the smaller towns in the surrounding area.

"We needed something to boost our volume, so we set out to work the smaller towns, and it has paid out," one of the salesmen explained.

Baton Rouge, La.

Reliable reports put the sales of standard commercial refrigeration equipment in the city and immediate environs through the middle of April as follows:

Twelve display cases.

Three large storage coolers (one for produce storage work, one for a hospital, and one for an institution.

Three small refrigerated boxes.

This was said to be about normal for the period in Baton Rouge over the last couple of years, although it was a little slower than the dealers had expected.

One factor that holds down market refrigeration sales in Baton Rouge: a city ordinance forbidding combination meat markets and grocery stores without a separating wall between. This has meant fewer sales of equipment because grocers have had a marked tendency in recent years to add fresh meats.

Trading Leads With Supply House Found Sales Aid

In the April 19 issue of AIR CONDITIONING & REFRGIERATION NEWS, a special issue on selling commercial equipment, a former sales manager for a commercial department of a big city distributor stated:

"Make a tie-up with a fixture house and butcher supply company."

That's just how Refrigeration Equipment Co., dealer for Carrier and Copeland machines, and Friedrich and Koch cases, operates. In a tie-up with a butcher supply house leads are traded and good words spoken for each other to the profit of both.

This company also had found happy hunting on the highways at crossroads stores, roadside stands, butcher counters. On one 25-mile highway stretch there were seven commercial refrigerators sold last year. The only way to get such business, says the dealer, it to go out and poke your nose around till you find it.

Unusual Installations Go To 'Odd-Jobs' Specialists

This company is selling General Electric commercial refrigeration, specializes on odd jobs—installations which require special engineering technique, mainly because of the reputation of L. S. Doherty, partner in the firm and engineer on commercial refrigeration.

In one such job for the Louisiana State University Mr. Doherty has a system that holds temperatures together to within one-thousands of 1° F. Such close control was obtained by Mr. Doherty through the use of manifold liquid and suction lines, and with controls operating through relays to pick up the slightest variation in the temperature condition and allow the system to remedy it immediately.

Another job which required some special engineering technique was the one which Mr. Doherty designed for a seed germination plant.

Stirling-Doherty also does air-con-

(Concluded on Page 5, Column 1)

Commercial Refrigeration

5 Compressors Serve 18 Separate Units In Elaborate Restaurant Installation

CHICAGO—Temperatures of 5 to 45° F. are provided for 18 separate refrigerating units in the elaborate refrigeration system designed for Isbell's Gold Coast Restaurant by engineers for Westinghouse Electric Supply Co.

Five condensing units supply the refrigeration, one of them being a "stand-by" unit for use in the event either of the others breaks down. Manifolds on each compressor permit the switch-over to the emergency unit, guaranteeing the restaurant from loss because of unit failure.

Six separate walk-in coolers are located in the building's basement for storage of meat, vegetables, beer, wine, bottled goods, and bulk ice, each being separately operated to provide proper temperatures and humidities for the various products.

In the kitchen, separate refrigerated compartments are provided for meat short orders, delicatessen short orders, sandwich unit, salad unit, an eight-hole ice cream cabinet of 40 gallons capacity, a water cooler, and an ice cube cabinet.

At the bar in the cocktail lounge, each of two ornamental center display piers holding wine and bottled goods has its separate refrigerating equipment. Beneath each of the two draft beer stations is another refrigerator, and one more, for bottled goods, is under the bar.

To avoid necessity for keeping seafood packed in ice, a 30-cu. ft. cabinet is located in the meat storage room, wherein fish, oysters, etc., are kept in a frozen state. When needed in the kitchen, a supply is placed in the seafood cabinet there, this unit being held at a temperature slightly above freezing.

Another feature of the meat storage cooler is a vestibule, pre-cooled to a predetermined temperature, the air entering from the main cooler. This is used for meat cutting.

Three general temperature ranges are provided by the refrigerating machinery. For the frosted food compartment, ice cream, and ice storage, temperatures of from 5 to 20° F. are held; meat storage and short order boxes are held between 35 and 38° F.; and vegetable storage sections, liquid cooling, and buffet equipment have temperatures between 40 and 45° F.

In the vegetable cooler, a forced-convection unit is used to maintain even temperatures and high humidities, and a similar unit also is used in the wine storage room. Thermostats for the coolers are so delicately adjusted that they respond to temperature variations as slight as those resulting from the opening of a cooler door to admit an employe.

Equipment used on the job includes five condensing units, two of them of 2-hp. capacity, two others 1½ hp., and the fifth of ¾-hp. rating. All the units are water cooled. Separate shut-off valves are provided for both liquid and suction lines, running to each unit, and all lines are brought down to the panel board.

Beer is pumped from the basement to the bar upstairs through tubes jacketed in water which is held in larger pipes surrounding the beer lines. Another feature of the system is use of a glass sight-gauge to indicate any leakage of the "Freon" gas used in the installation.

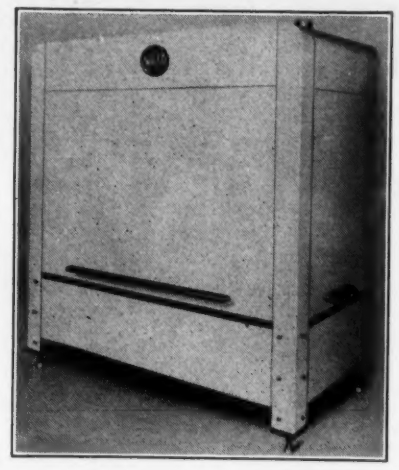
Grant Key Opens Branch In Charlotte, N. C.

CHARLOTTE, N. C. — Grant E. Key, Inc., distributor in this territory for the Bastian-Blessing line of soda fountain equipment, has opened a branch here in charge of J. L. Sisk, who has represented the Key firm in North Carolina for the past two years. Headquarters of the distributorship are in Lynchburg, Va.

Grant E. Key, Inc. was formed five years ago when Knight Soda Fountain Co. merged with Bastian-Blessing Co. At this time, Mr. Key, a successful Knight salesman well known throughout Virginia, was given the Bastian-Blessing distributorship for that state. Since then his territory has increased until now it also embraces not only the Carolinas but part of Tennessee as well.

Associated with Mr. Key in his sales work are, besides Mr. Sisk, George H. Mason, W. F. Carter, Jr., and H. J. Dixon. Service department is headed by L. R. Lipscomb.

New Plate-Type Cooler Announced By York



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YORK, Pa. — A new "High-K" plate-type water cooler has been announced by York Ice Machinery Corp. It is offered in three cabinet models, holding from one to six stainless steel plates. Largest unit has a 90-ton refrigerating capacity.

The complete cooling surface with entire refrigerant feed and control equipment is enclosed in a single, insulated cabinet. All interior surfaces are accessible for inspection and cleaning by removing lightweight side and end panels.

Exterior has flat surfaces and smoothly rounded corners, finished in crinkled light gray and black enamel. The unit is designed to supply uniformly cold, clean, fresh water for bottlers of carbonated beverages, bakeries, dairies, drinking water systems, and industrial processing.

Gould-Farmer Transfers Sims To Binghamton

SYRACUSE, N. Y.—George Sims, formerly connected with the Syracuse headquarters of Gould-Farmer Co., General Electric distributor, has been transferred to the company's Binghamton, N. Y. branch. H. Wescott is now located at the store here. Art Snyder is manager of the company's refrigeration service department.

Copper Tubing Best For Water, Doherty Says

(*Concluded from Page 4, Column 5*)

ditioning and home heating sales and installation work.

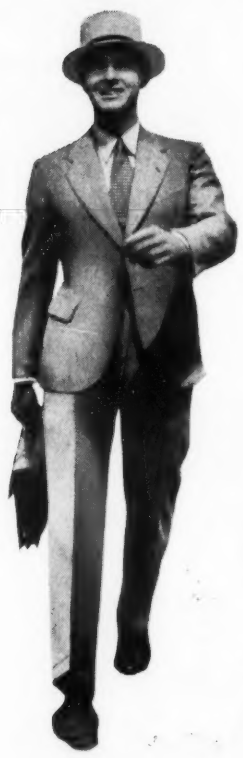
In the home heating field, Mr. Doherty has utilized his experience in refrigeration installation work in a way which might be copied by other dealers in the south who have a similar set-up.

Mr. Doherty prefers hot water as a heating medium in residential work. To carry the hot water to the convector-type heating units, Mr. Doherty has refrigeration installation men "sweat-in" ½-inch copper tubing throughout the house. The copper tubing lines are insulated with rock wool properly sealed. Water is forced through the system by a pump designed to do a somewhat heavier job than is encountered in a similar system installed in the conventional manner.

The convectors made by McQuay are small floor-type units with legs. They are equipped with dampers which make it possible for the home owner to regulate the heat he will get in any one room.

"It cuts costs, speeds up the installation time, and gives us complete control of the job and all the profit on the labor," explains Mr. Doherty in telling why he likes to use copper tubing on the heating job.

JUST A STEP OR TWO



Air Conditioning
NEEDS
SALESMANSHIP

WHEN a new product appears on the market and offers the way to better living, it does not necessarily mean that the buying public will set up an immediate clamor for it.

Usually it must be pioneered and its use and need promoted. Usually it requires selling effort.

We have all heard of the building of mousetraps in the wilderness, but did anyone ever see this man, or the "path to his door," or any of his mousetraps?

Things just don't work out that way.

Even when markets exist, sales must be created if volume business is to be obtained.

WHEN electric refrigeration was young there was no line-up of waiting customers at the dealer's door when he opened his shop every morning.

His meager daily mail contained no blueprints and specifications setting forth the refrigeration requirements of the families in his community and asking him to submit his bid on the required equipment.

All he had was a good product and a territory in which to sell it.

And he went to work on that basis.

For him there was no substitute for canvassing. He had to go out and dig up his own prospects and follow them up until he closed or lost the deal.

His was creative, bare-handed selling. He built up a successful sales and service organization. He made sales, he made money.

Commercial refrigeration has been sold and is being sold by this process.

AND now air conditioning.

During past years manufacturers have experimented with marketing plans—trying to sell through this channel, that channel, other channels.

The results of this experimenting have now become apparent. It is evident that there are two principal types of outlets for air-conditioning equipment:

1. Large contracting companies who obtain their business by bidding on specifications submitted to them and who are not organized for the purpose of creative selling.

2. Specialty sales and service organizations whose principal income is derived from equipment sales and who do a creative selling job.

Aggressive merchandisers, the distributors, dealers and their salesmen who comprise this latter group of specialty sales organizations are thoroughly trained in specialty selling. And they have a solid background of experience in refrigeration. For them it is but a step or two into the air-conditioning business.

REFRIGERATION and air conditioning have much in common. Both involve control of temperature and humidity, heat transfer, and similar factors. Both include the use of compressor and coils, valves and controls and refrigerants. They are as closely associated as bread and butter, ham and eggs.

Air conditioning naturally intrigues the interest of specialty selling organizations.

It appeals to their imagination. It appeals to the sporting instinct inherent in every genuine and successful specialty salesman—for it opens new fields for the financial rewards of creative selling effort.

With the development of new models offering a wider range of capacities and thus enlarging the field of applications for "package units," air conditioning has become more attractive to them than ever before.

To the air-conditioning manufacturer, these specialty sales organizations offer a quick, direct route to sales volume—a route that has been tested and proved by past performance.

THAT established refrigeration distributors and dealers can successfully sell air conditioning is no visionary speculation. Many of them have been doing it for some time. The present trend is more and more in their direction. Manufacturers desiring to establish contact with these specialty sales and service organizations will find advertising in the NEWS an effective means of accomplishing that purpose.

Air Conditioning & Refrigeration News

"The Newspaper of the Industry"

Sales Training & Supervision Can Turn Conditioning 'Suspects' Into 'Prospects'

Methods of Locating Genuine Prospects & Cutting Engineering Costs Described

Last week Mr. Price outlined succinctly the difference between a staple and a specialty, and the difference between the proper sales methods to be applied to these two general product classifications. He then demonstrated how and why air conditioning is a specialty.

This week Mr. Price starts digging into the pay dirt of Specialty Selling as applied to Air Conditioning. He briefs the organization and training of a sales department, the getting of "suspects" and their qualification into "prospects."

As you can see by reading them, these articles are not "swivel chair" selling advice. They are the how-it-is-really-done "inside dope," straight from a man who has spent years in the field working with air-conditioning distributors.

At the end of the article Mr. Price poses four questions commonly asked by prospects. In his next article he will answer them.

By Wm. H. Price, Jr.
Recently Vice President in Charge of Sales, Carrier Corp.

IF a profitable sale cannot be made there is no need for capital, management, engineering, construction, or service. And the sales problem is the most important dilemma before the air-conditioning industry today. As a contribution to that problem, I offer the following guide to the profitable sales organization:

A. **Organize a Real Sales Department.** It may be one man or it may be many men. In taking on new men, look for the personality that fills the doorway; look for the man who can smile; look for the man who talks well and who can lull his prospect into a condition of mental repose or comfort, because most things are purchased when the prospect is in a comfortable frame of mind.

Only such things as revolvers, poison, and caskets are the exceptions to this rule.

'ALLOWABLE EXAGGERATION'

Hire salesmen who know how to take an allowable percentage of exaggeration in direct proportion to the amount his listener may be discounting his remarks.

A salesman, if keen, will know how much his prospect is discounting his statements, and should be permitted (within reasonable limits) to match this discounting with a counter-balancing exaggeration.

At the end point, or when the sale is finally made, there should be no rate of discount on the part of the purchaser, and no rate of exaggeration on the part of the salesman. Then there has been a real "meeting of the minds."

B. **Train Your Sales Organization,** and train them well. Train them religiously, train them constantly, train them everlastingly. Train them in the products and in the beneficial services the products perform and produce.

Then train them in the **need** for the product; **where** this need exists; how the product **satisfies** the need; why the product is **worth** what is being asked for it; and why the prospect needs it now.

Have your salesmen tell **you** their sales story before you let them loose upon the public. If you will listen to some of their stories, you will soon understand why you are losing some of your business.

A salesman must be **trained to be effective.**. He has so **little time** in the presence of the prospect, compared to the time spent by the engineers and construction men on the job. And yet he has to be **so effective** in so short a time.

C. **Get Yourself Some Suspects.** Ge them by advertising, by direct-mail, by help from the utilities, by telephone solicitation, from satisfied users, by personal solicitation,—or in any way you can. But, don't get them **all** from building report services.

This latter type will be Public Suspects or Prospects, know openly to all your competitors, and you will then only be engaged in a bidding contest. Get yourself some Private Suspects that your competitor has not, as yet, talked to or cultivated.

QUALIFYING SUSPECTS

D. **Qualify These Suspects.** I attach great importance to this. Too many salesmen are permitted to bring in a big roll of blue-prints, throw them down on the engineer's desk, and ask for a detailed layout and price estimate that might involve the expenditure of many dollars of engineering and drafting time,—without having had the suspect properly qualified.

In addition to credit rating, the suspect should be qualified along four lines:

1. Is he **really** interested in having the work done by somebody, or is he merely curious?

2. Is he fairly well sold on having it done by **your** organization?

3. Is there a reasonable chance that he will be willing to pay you **your asking price,** or will he expect you to meet the lowest price offered by inferior competition?

4. Is he interested in having the work done NOW, or would 1941 be just as good?

Unless the suspect is **affirmatively** qualified on all these four points, he should never be labelled as a **prospect,** and until he becomes that kind of a prospect, you should avoid all unnecessary expense **except further sales expense.**

CUTTING ENGINEERING COSTS

Budget estimates should be substituted for firm quotations; line drawings, if any, should be substituted for layouts,—and thus the engineering expense (which is extremely high in the industry, and often completely wasted) will be substantially lowered.

And **who** should do the qualifying? The salesman? Never! You hire him because of his **enthusiasm,** be**cause of his belief** (not his disbelief), because of his never taking "No" for an answer, and because of his optimism.

All suspects are prospects to the ordinary salesman, but you want to reach the point where you are getting one job out of every three you bid, rather than only one out of every five or six upon which you have spent your engineering expense.

So, if your business is of the size that will support a supervisor for the salesmen, he may act as the qualifier, or you as the head of your business may go out and do this work. As a matter of fact, I believe it would be one of the most important profit-making moves you could make.

WHAT TO SAY

After the credit has been checked, you qualify the suspects right down through all four points. Say to him, for instance:

"Our Mr. Jones has just brought in your set of plans, Mr. Smith, and I wanted to come over personally to tell you that we are beginning at once to work up a fine set of detailed layouts for your approval."

Or tell him:

"I'm glad to know that you appreciate the type of work we do, and that while it may be a bit high in first cost, you will probably not make first cost the only basis on which your decision will rest."

Or tell him:

"I'm here to gain a more definite idea as to just when you will want the installation made, so I can make proper arrangements with our construction department."

If you will do this, in a substantial number of cases you will get these replies:

"Well, don't spend much money in making plans for me, I just wanted to know about what it would cose."

"Your salesman told me he was in a contest, and I didn't have the heart to turn him down."

"I'm not going to pay any premium over the prices I'll get from other people in the business, and I'm going to let a lot of people bid on this job."

"Well, I probably will not be doing anything about it until next year, as it's a little late in the season now."

HOW TO PROCEED

If the suspect qualifies **negatively,** as in the above illustration, the supervisor, or yourself are right there on the ground with the prospect for a second shot at him, **saleswise.**

If your sales work with him then leads you to qualify him **affirmatively,** call him a prospect, and let your engineering department proceed.

But if you qualify him **negatively,** you will at least have the choice of passing him up as a prospect upon whom it might be profitable to work, or you can, if you choose, do the engineering work, knowing in advance that it may be wasted.

Is this not a better constructive measure than to proceed blindly upon the original salesman's enthusiasm, or upon his ignorance in being able to recognize a worthwhile prospect?

E. Employ a Logical Sales Story. There are many schools of sales-training, and there are many methods which take the salesman along the path to a sale. I'd like to illustrate one which I personally believe to be the simplest and most effective I have seen. The story is in four chapters, as follows:—

I. **Why air conditioning** at all from any seller?

II. Why air conditioning **from the "Z" company?**

III. Why air conditioning from the "Z" company **at the "Z" company's price?**

IV. Why air conditioning from the "Z" company at the "Z" company's price **NOW?**

(To Be Continued)

Air Equipment Reversed In Store Installation

TULSA, Okla. — Reversal of air handling equipment used for ventilating the basement of the Froug Department store here served as the basis for a 20-ton air-conditioning system installed by Natkin & Co.

In the past, a 2½-hp. fan was used to draw air from a duct running the length of the basement, and exhaust to the outside. By reversing the action of this system and adding a certain amount of ductwork, it was possible to transform the equipment to a complete air-conditioning system.

Square mesh grilles used in the old ventilating system were changed to directional flow, air-conditioning type outlets. A 20-hp. Westinghouse compressor and evaporative condenser were installed adjacent to the store.

By building a new housing for the old fan, provision was made for the installation of a Westinghouse cooling coil and the necessary filters.

First and second floors of the Froug store have an existing air-washer system, and operation of the new basement cooling system will be compared with the existing system on the upper floors.

New Apartment Bldg. In New York Fully Air Conditioned

NEW YORK CITY — First new apartment building in Manhattan designed and equipped for complete air conditioning is the 56-family building at 25 East 83rd St. Built of steel, concrete, and structural glass blocks, the apartment is said to be completely sound-proof.

Each apartment has its own air-conditioning system, controlled by two thermostats and a summer-winter switch. Manipulation of this switch by the tenant determines which thermostat shall control the operation of the air-conditioning system.

Cooling capacity is provided by a 140-ton compressor located in the basement of the building; chilled water at 40° F. is piped to each of the 56 individual conditioning units. Duplicate pumps have been installed to prevent failure of the system at any time.

Steam for heating is provided from two cast iron oil-fired boilers, which are operated without vacuum or condensate pumps. Spray water of the proper temperature is provided for humidity control.

Conditioning units are installed in equipment rooms just off the public halls on each floor. Entrance to these rooms is from the corridor, so units may be serviced without disturbing tenants.

Each unit has its own fresh air inlet and filters, to maintain a high degree of cleanliness in the apartments. Air from kitchens and bath rooms is exhausted by means of centrifugal fans located on the roof of the building.

Individual duct systems running from the conditioners to each apartment provide a degree of isolation for each tenant usually found only in a single residence. As no air is recirculated from other apartments there is no danger of spreading illness or infections throughout the building.

'High Pressure' Salesmanship Methods Are Not 'Fraudulent Representations,' Judge Says In Air Conditioning Damage Suit

(*Continued from Page 1, Column 5*)
of this and other jobs, and that he had installed other air-conditioning jobs of this type, and that the equipment was the best that could be procured for the job. (Only by charging fraud could the plaintiff seek damages on representations outside of the contract, according to legal authorities).

(2) That the defendant was negligent in his manner of making plans for the installation, and in the actual making of the installation.

(3) That the defendant failed to perform its part of the contract by its failure to make the installation in accordance with the terms of the contract.

'PENALTY CLAUSE'

(4) That the defendant failed to complete the installation on the date specified in the contract, and had not completed the contract at any time, and that therefore the plantiff could collect the $100 specified in a $100-per-day penalty and liquidated damages clause in the contract covering failure to complete the installation within a certain period of time.

(5) That the increased water consumption because of the air conditioning was more than the $100-per-month limit specified in the contract, and that the combined water and power bills were more than the $250 per month limit specified in the contract.

In its bill of particulars the plaintiff enumerated as its chief items of damage the failure to receive an "expected increase of 40% in its business through the installation of air-conditioning," and the claim of actual loss of patronage and good will because of the alleged failure of the air-conditioning system to perform properly.

COURT RULES ON ONE COUNT

The court, upon motion by the defendant's counsel, gave a directed verdict for the defendant on the fourth count (the penalty clause) on the grounds that no damages had been shown and that since the equipment was started on May 30 there was no cause of action; and the rest of the counts were submitted to the jury, which found that the plaintiff had no cause of action on any of the other four counts.

In his charge to the jury Judge Smith brought out a couple of points that may be highly significant if lawsuits of this nature get into the courts in the future.

One of these was that mere "puffing" or "high pressure" salesmanship does not constitute fraud.

It is up to the jury to decide, the judge declared, whether there was any difference between this and any other like instances of conversation between ordinary bargainers, and whether the representations made in the negotiations leading up to the contract were representations of fact, or mere matters of opinions that might reasonably be used by the seller in merchandising his product.

It was also ruled by the court that if negligence was to be shown, it was up to the plantiff (buyer) to prove what the alleged undertaking actually was, and to prove that it was done in a negligent manner.

NOT ENTITLED 'TO BEST JOB'

The buyer is not entitled, as was alleged by the plaintiff's counsel, to the "best possible job," that could be done, but only to a job that conformed to what the contract specified, and that it was done in a workmanlike manner, the court ruled in making its charge to the jury. If the jury found that the defendant (installing firm) had done the job to the best of its ability, with existing conditions taken into consideration, then the jury must find that the contract had been fulfilled, it was stated.

Counsel for the plaintiff took an exception to this part of the judge's charge, declaring that his client had been induced to buy on the basis of a certain type of air-conditioning "performance" he would receive and not on the specifications of the equipment, and that the defendant had not fulfilled its part of the contract because such "performance" was not delivered.

On the count seeking damages for the alleged excess monthly costs over the amount stipulated in the contract, the court charged that the plaintiff must have proved that such excess costs were chargeable to the defective operation of the system before it might collect damages on such a count.

The heart of the whole case, the judge said in addressing the jury, was whether or not the defendant (installing firm) by improper planning, furnishing incorrect equipment, and poor installation methods had failed to do what the contract stated he would do.

The jury was also instructed that if in its counterclaim the defendant (installing firm) proved that it had substantially performed the contract, it could collect the balance due it on the contract, with the possible deduction of the amount the jury deemed necessary to fix up any apparent defects in the system. The jury apparently followed this latter procedure in arriving at its verdict.

WHAT TRIAL DISCLOSED

In reporting this trial AIR CONDITIONING & REFRIGERATION NEWS is not trying to present the merits of either side in a particular case, but to pick out the part of the testimony and the judge's rulings on evidence that will furnish information perhaps for the future guidance of the air-conditioning industry, particularly with respect to the drawing up of contracts for air-conditioning jobs.

The information that was obtained was developed along three major lines: (1) the things in an air-conditioning contract, or an agreement written or verbal, that may possibly be brought up in litigation; (2) the kind of things that a user may claim "dissatisfied" him with his air-conditioning system; (3) the rulings by the court on what is admissible evidence in a suit involving the performance of an air-conditioning system, particularly with reference to what constitutes "expert testimony."

Element of time of completion of the installation apparently played a large part in this particular contract, the buyer claiming that failure to have it installed by May 30 would mean a potential loss of business since, said Proprietor Jules Endler, "it is well known among restaurant owners that air conditioning brings an average of 40% increase in business during the summer months."

A penalty clause was inserted in the contract providing for the payment of $100-per-day penalty or liquidated damages for every day past the time specified for completion of the installation.

WAS IT TENDERED?

There was some dispute over just what constituted the formal completion of the contract, the buyer contending that the completion of the contract was never formally "tendered" to him, but the installer claimed that the turning on of the system on the day specified for the completion of the job was evidence of the completion of the contract.

When the counsel for the plaintiff (buyer) introduced testimony that the installing firm had represented that "they had the best men in the field" to engineer and install the installation, and that this was in fact a misrepresentation, the defendant's counsel objected on the grounds that representations as to the adequacy of the work and the men doing it was included in the contract.

TESTIMONY ON SALES TALK

The court, however, allowed the testimony to be given on the grounds that it was evidence of representations made leading up to the execution of the contract.

Counsel for the buyer put on the stand a representative of the Carbondale division, Worthington Pump & Machinery Corp., to testify as to the capacity of the evaporative condenser installed on the job. He testified that the "normal capacity" of the evaporative condenser was a rating of 50 tons.

Under questioning by the court (the judge) the Carbondale executive admitted that the capacity of the evaporative condenser may vary rather widely, depending upon outdoor atmospheric conditions, corollary equipment, etc. Reduction in the c.f.m. of air flow through the evaporative condenser will reduce capacity, the witness testified, but not in a directly proportional ratio.

'NOT FOR LAWYERS?'

A somewhat interesting, if not highly significant piece of testimony, was that given by the plaintiff to the effect that his brother, a lawyer, had told him that the contract for the air-conditioning installation was a "matter for engineers, not for a lawyer," and that "your ultimate guarantee will rest upon performance and cost of operation."

In his testimony relating to the allegation of damages suffered because the "air-conditioning system did not function properly," Mr. Endler related how he had spent some "$50,000 in redecorating the place," purchasing new furnitures, and fixtures, etc.

"What did the new furniture have to do with the air-conditioning system," Judge Smith interposed, supplementing an objection to this testimony raised by the defense counsel.

Counsel for the bar and grill owner explained that the idea of such testimony was to paint "one grand picture" of the plaintiff's plans which "centered about the installation of the air-conditioning system."

'PICTURE PAINTING'

The court allowed the testimony to be entered for the purpose of the "grand picture," but sustained the defense counsel's objection to specifying the amount spent on new furniture, fixtures, etc.

Later in telling about his plans for the grand opening on June 20, Proprietor Endler explained how he had gone to some trouble to get "my friends Rudy Vallee and Jack Dempsey to come to the opening"—

"What difference does it make to this case if Rudy Vallee was on hand for the opening," Judge Smith inquired, somewhat testily. No more "picture painting" was done by the plaintiff.

ADVERTISED COOLING

In the cross examination of Mr. Endler by the defense counsel, it was brought out that in a three-quarter page advertisement announcing the grand opening of the Novelty Bar & Grill on June 20, very prominent mention was given to the new air-conditioning system, in fact the whole advertisement seemed to be centered about the new cooling system. Mr. Endler claimed that this part of the advertisement had been included at the specific request of officials of the installing firm, and that they had even offered to pay for part of the cost of the space. However, there was no proof of this offer, or any proof that the installer paid for any part of the space.

One of the items of complaint made by the buyer was that some of the work in adjusting the system was done in the premises in the middle of the day, when the contract specified that all such work should be done between midnight and 10 a.m.

WHY HE KEPT USING IT?

The plaintiff declared that although "he wasn't satisfied with its operation," he kept the system running because the installer told him: "how are we going to find out what is the matter with it unless it is operating?"

Some of the plaintiff's claims of damages seemed outlandish, particularly those pertaining to the amounts of water from condensation that dropped down from the anemostats; the water that soaked through the insulated refrigerant lines; and the claim that smoke from the burning out of the motors got into the air stream and made customers displeased, in addition to discoloring the ceiling around the anemostats!

EVAPORATIVE CONDENSERS

Counsel for the plaintiff attempted to establish in several different ways that the evaporative condenser used on the job was not delivering the capacity that it should. He said that the installing firm "admitted its error in the placement of the evaporative condenser" by seeking permission to move some old, out-of-use iceboxes near the window, and he further claimed that they admitted this move was necessary because "they said they were only getting 8,000 to 9,000 c.f.m. of air through the evaporative condenser and they needed 20,000 c.f.m."

On the question of whether or not the installation was properly tendered to the buyer on May 30, the defense counsel finally got Mr. Endler to admit that the system was turned on as of that date and that it was "giving some cooling," but not enough to satisfy him.

HAD GRAND OPENING

However, the counsel for the installing firm showed that if the plaintiff was dissatisfied, or didn't believe his system was working, he nevertheless went ahead with his celebration of the grand opening on June 20, in advertising for which the air-conditioning system was featured, and that after the party a picture appeared of Mr. Endler with Jack Dempsey together with a story that the ex-champ had been over to help Mr. Endler celebrate the opening of his new air-conditioning system.

Counsel for the defense (installing firm) claimed that the proprietor had expressed himself as a being "100% satisfied" with the job to one of the installing firm's employes on the night of the June 20 grand opening celebration, but the plaintiff denied this and in refutation pointed out that three of the installing firm's employes were on hand trying to get the equipment to work; this in turn was denied, the employes stating they were there as "non-paying" guests and were at the party all of the time.

Thus it might seem that it would be risky for a contractor to go around and visit a user's establishment or buy a drink from him, on the basis that it might be used against him some time.

WATER BILLS ENTERED

Counsel for the plaintiff succeeding in having read before the court the comparative water and power bills for four monthly periods in the summer of 1937 (without air conditioning) and 1938 (with air conditioning). However, the judge's ruling with respect to this evidence was as follows:

"Any increase in water and power bills may not be considered conclusive figures, since other factors may be involved, but they are allowed for whatever credence the jury may weigh and give them."

Comparative figures on water consumption as taken from the bills are as follows:

May 26 to June 24, 1937.	$ 86.75
May 26 to June 28, 1938.	149.50
June 24 to July 29, 1937.	111.58
June 28 to July 29, 1938.	239.20
July 29 to Aug. 30, 1937.	107.03
July 29 to Aug. 30, 1938.	234.60
Aug. 30 to Sept. 28, 1937.	112.70
Aug. 30 to Sept. 28, 1938.	191.48

Comparative electric light and power bills for these two periods were as follows:

May 12 to June 11, 1937.	$695.60
May 12 to June 11, 1938.	859.48
June 11 to July 12, 1937.	708.40
June 11 to July 12, 1938.	1182.80
July 12 to Aug. 11, 1937.	652.00
July 12 to Aug. 11, 1938.	1178.00
Aug. 11 to Sept. 13, 1937.	684.00
Aug. 11 to Sept. 13, 1938.	1140.80

Plaintiff's counsel then brought out the fact that the contract stipulated that the water consumption would not cost over $100 a month, the plaintiff testifying that he had "talked with friends who had air-conditioning systems and they told him that $10 to $12 a month was enough for water, but he allowed the $100 figure to go in, even though it seemed ridiculous."

GAIN IN OTHER MONTHS, TOO

In answer to this the defendant's counsel produced as a witness a clerk in the Newark city water department, who gave comparative bills for months in 1937 and 1938 when the store was not being cooled, and in each of these months increases in the water bill were shown, some running more than 50%, thus indicating that the installation of the air-conditioning system had not been totally

(*Continued on Page 9, Column 1*)

'Report By Agent of Manufacturer Not Binding on Distributor,' Court Rules

(*Continued from Page 8, Column 5*)

responsible for the increase which the plaintiff had put into evidence.

Counsel for the plaintiff (buyer) attempted to enter in evidence a report purported to have been written by an engineer in Kelvinator's air-conditioning applications department who had been called in, the plaintiff's attorney charged, for the express purpose of making recommendations for the alteration of the system installed in the Novelty Bar & Grill "so that it would work."

Only a carbon copy of the report was produced, and on cross examination the officers of the company and the distributor's engineer who supervised the Novelty Bar & Grill installation all denied having seen the report.

REPRESENTED MANUFACTURER

Judge Smith sustained the defense counsel's objections to having the report entered as evidence not only on the grounds that the existence of the report was not established, but also being it was written after suit had been started, **and because the man in question was not an agent of the distributor.** He represented the manufacturer, but it was the installer that was being sued, the judge pointed out, and since he was not connected with the company being sued, his report was not admissible as evidence.

Even if the manufacturer's engineer had been called in expressly to view the job, it made no difference, the judge declared, because any one might have been called in to inspect the job and any report that such persons might make would have to be classed as mere hearsay, and not binding evidence.

JUDGE WON'T ALLOW IT

Later the plaintiff tried to put on the witness stand a stenographer formerly in the employ of the Krich-Radisco Co., and she stated that she had taken the report in straight dictation from the manufacturer's engineer while he was visiting the distributor's office, but under questioning by the court she declared that as far as she knew he had not signed it in any other capacity than that of a Kelvinator engineer, and the judge would then allow no more to be said about the report.

As one of its witnesses to give "expert testimony" the plaintiff (buyer) put on the witness stand Charles A. Fuller of the firm of Slocum & Fuller, New York City consulting engineers. Mr. Fuller is also the author of a book on air conditioning.

He was asked by counsel for the plaintiff to explain in what respects he thought the contract for the installation of the air-conditioning system in the Novelty Bar & Grill had not been fulfilled.

Mr. Fuller's principal criticism was directed at the evaporative condenser used on the job, principally from the standpoint that the ducts carrying air to and from the apparatus (which was located back in the basement) reduced the airflow and consequently cut the capacity of the condenser. He declared that he took readings with an anemometer at the intake side of the evaporative condenser.

EXPERT VS. EXPERT

Mr. Fuller's testimony on these points was answered by the defense along two lines: (1) that the original diagrammatic drawing showing the layout of equipment, which drawing accompanied the contract, indicated the location of the evaporative condenser to be at the window, but that the installers were prevented from installing the condenser there on orders from the proprietor, and that later efforts to move it were also blocked; (2) that it was impossible to obtain accurate readings with anemometers or similar instruments, Fuller's own book stating that it was impossible to obtain readings on the suction side of a return air grille. The installer caused watt hour input tests on the evaporative condenser fan motor to be made by the power company, and these results were plotted against a fan performance curve, and indications were that the fan was delivering its rated capacity.

Another criticism of Mr. Fuller's was that the fresh air intake was from an areaway in which garbage was kept, and into which air was vented from lavatories. Answer of the defense was that the location was decided upon as the best available under the circumstances, that keeping garbage odors from permeating the areaway was the user's problem, and that the lavatory ventilating system was installed **after** the air conditioning had been put in.

LITERATURE INTRODUCED

Flow of the air upwards through the cooling coils was attacked by Mr. Fuller, who claimed that such direction of flow was not the usual practice and that it allowed condensate to drip into the airstream. Defense answered this through A. U. Zimmerman of Quinn Engineering Co., New York Carrier distributor, who showed bulletins of standard equipment in which the flow of air was exactly the same as that in the Novelty Bar & Grill job.

Mr. Fuller also declared that the air-distribution system was "not in accordance with the best engineering practice."

"What is the 'best engineering practice?'" inquired the judge. "Are you engineers all agreed on what is the best engineering practice?"

To which question Mr. Fuller had to shake his head in the negative.

THREATS WERE IDLE

The defense put some emphasis on a letter written by the lawyer brother of the plaintiff, stating that if the installer could not get the job working to their satisfaction by July 1, 1938, to rip out the equipment and allow the user to have a new system put in by someone else. But since the threat conveyed in this letter was never carried out, the defense claimed that it was another piece of evidence pointing to acceptance of the system by the plaintiff.

Paul Carey of Runyan & Carey, consulting engineer in Newark, was another "expert" brought to the stand by the plaintiff (buyer). He testified to a number of alleged physical defects in the system, and gave an itemized account of what it would cost to fix it up. Some of the defects he enumerated—such as piping held up by string and the duct insulation being sealed on by paper tape—were later seemingly disproved by direct testimony and pictures prepared by the defense counsel.

NEW COST ESTIMATE

In making his estimate for "putting the system into working order," Mr. Carey was most generous with his method of figuring profits and fees. Over the estimated cost of fixing up the system he suggested adding 20% for the contractor's profit, another 10% on top of that for the contractor's overhead, and another 10% on top of that for an engineering fee. He then admitted that a 20% leeway should be given for his calculations. The defense counsel attacked this as being an outlandish set of figures.

In the cross examination of Mr. Fuller, the plaintiff's "expert" was asked if he had determined the head pressures and suction pressures at the time he was making his tests to determine the capacity of the evaporative condenser. He replied that he had not, and the defendant's counsel made a point that this was one of the many other factors besides the flow of air through the apparatus that determines the capacity of an evaporative condenser.

'INSTALLER CAN SHOW WHAT HE DID—'

When the defendant's (installing firm's) counsel introduced into evidence drawings showing details of duct design, water piping, structural steel detail in the air conditioner, refrigerant piping, etc., the plaintiff's counsel objected to these on the grounds that these detailed specifications were not involved in the contract. The court refused to sustain this objection, stating:

"Isn't the issue whether or not the job was well built or installed? I think the defendant is entitled to show everything that they did to make the job a good one."

Charles Murphy, who was chief engineer of the Krich-Radisco air-conditioning department at the time the Novelty Bar & Grill job was going in, testified that he had given instructions to the restaurant's maintenance man and to the restaurant's general manager as to how the air-conditioning equipment should be turned on and off, and that the disregard for these instructions had resulted in the repeated breaking of compressor crankshafts.

As testified to by Mr. Murphy, the blower motor for the air conditioner, and the motors for the condensing units, are controlled separately. An on-and-off switch controls the fan, and a transformer switch is employed to turn the compressors on and off. Mr. Murphy testified that he had warned both of these employes of the plaintiff's place of business not to turn off the blower without turning off the compressors.

USER NEGLIGENCE CLAIMED

The first time that a broken crankshaft was reported, the distributor's engineer testified that an inspection of the plant revealed that the fan motor had been turned off, but that the transformer switch had been left on.

Under such circumstances the control apparatus was still working, with the result that if the thermostatic control called for cooling, the solenoid valves would open allowing liquid refrigerant to pass into the cooling coil. With the blower not working, this liquid refrigerant would not evaporate or "boil out" completely, with the result that the liquid refrigerant would go back to the compressor in considerable quantities.

Since the compressor is designed to compress gases and not liquids, explained Mr. Murphy, the stress placed on certain parts of the compressor resulted in the breakage of the compressor suction valves, pieces of which fell into the piston, this then resulting in a shortening of the compressor stroke and the placing of a great stress on the crankshaft, ultimately breaking it.

This could not have happened if the transformer had been pulled, the witness testified, because in that case the solenoid valves would not have operated and the liquid refrigerant could not have gone through.

Mr. Murphy's testimony was corroborated by John Hayn, Krich-Radisco service manager, who testified that he had pulled the head off the compressor in which the broken crankshaft was found, and discovered pieces of the broken valve in the cylinder.

CONTROLS CRITICIZED

The plaintiff's counsel seized upon this contention, particularly in his cross examination of Charles A. Shaw of the Preferred Utilities Co., which firm sold the controls for the job.

Counsel asked Mr. Shaw if this "dual control" system whereby the blower motors and the compressors were controlled separately was good engineering practice, and if a "synchronous control" whereby the fans and compressor would be turned off together would not be better.

Under the circumstances, witness testified, the "dual control" system was perfectly good engineering practice, because the system was a year-around installation, and independent operation of the fan was needed for winter operation, there being no point in having the compressor hooked up with the fan operation in the winter. This "dual control" system also prevented the possibilities of "freeze ups," it was explained.

Counsel for the defendant asked Mr. Shaw on direct examination if the control system did not conform to the standards established by American Society of Testing Materials, and the American Society of Refrigerating Engineers, and various other groups. He testified that it did, but the plaintiff's counsel objected on the grounds that the witness wasn't qualified to make the answer.

The judge ruled that he would allow the answer if the witness would declare that he was familiar with the standards.

Harrison Pease, New York City consulting engineer, appeared as an expert for the defendant (installing firm), and backed up Mr. Murphy's theories about why the crankshaft broke.

He was cross-examined on the point of whether or not the expansion valves should not have kept the liquid refrigerant from slugging through to the compressor, but Mr. Pease testified that after the solenoids had opened allowing the liquid to go through, there was no expansion valves he knew of that would keep the liquid out of the coils.

He was also asked if it would not have been better for the fan always to turn on before the compressor, to which he replied that this might be better practice, if some provision were made to prevent the possibility of freezing the condensate, etc.

While Mr. Pease was on the stand he got in a statement that was apparently significant to both the

(*Concluded on Page 13, Column 3*)

Trade-Ins Troubling Some Southern Dealers, But Others Turn Them Into Profits

Story of 'Too Many Dealers' & Ruthless Price-Cutting Tactics Is Repeated

By Phil B. Redeker and Robert M. Price

New Orleans

"Give us a low-priced box—and dress it up with features." That is the cry of many dealers here, as they are experiencing a sharp increase in the number of "price buyers" this year. Sales to low income families can be made by independent dealers, instead of by mail-order stores or cut-rate operators, only if the price is right and the box is not "stripped," dealers say.

Good used refrigerators are much in demand here, but profits through resale have been cut, in many cases, by high allowances. Control of these allowances is now being sought, as the replacement business is beginning to assume importance.

Electric refrigerator sales for the first quarter of this year were up over 10%, and dealers are aiming the full strength of their sales efforts toward the large bloc of non-users in the New Orleans area.

The local utility this year has "hand-picked" 10,000 prospects—with yearly incomes above $1,500—who are not using electric refrigeration. These prospects were passed on to dealers.

Only about a third of the 90,000 residential meters in the city area had electric refrigerator installations at the offset of the campaign. The large colored population of the city, and the large "drifting" population, are factors reducing the total available refrigerator market. As yet, the replacement business has not been large for the majority of dealers.

Refrigerator sales last year did not follow the sharp sales dip of the national market, decrease from 1937 volume being only about 17%.

Attic fans are gaining favor, with an increase from 600 sold last year to an estimated 2,000 for 1939. Electric ranges are not being sold to any great extent because of the great quantities of natural gas available for the cheap operation of gas ranges.

Limiting Dealerships Sought By Utility

Although New Orleans Public Service Co. is still in the business of merchandising electric refrigerators, selling Westinghouse, it has been very active in cooperating with dealers on campaigns, in promoting electrical merchandise, and in improving conditions in all branches of the local appliance industry.

This utility intends to keep on merchandising of refrigerators, at least for the next few years, according to E. N. Avegno, manager of the dealer sales division, because it believes that many of its customers look to the company first when in the market for a refrigerator, because of the many special services offered. It is expected that about 10% of the total volume on refrigerators in the city will be sold by the utility this year. It was pointed out that, as saturation increases, this percentage of volume, now the largest in the city, would become much less.

In attempting a control of distributor and dealer setups, the utility is moving to limit the number of dealers in the city. It is thought that through the cooperation of distributors, dealers can be put on such a basis as to stay in business—and make money. Some attempts at control of dealer price discounts to customers already has had good results.

In controlling trade-ins, the utility has taken the lead by not offering trade-in allowances of any kind. Distributors have agreed that no advertising of used box allowances would be used.

Combination sales of major appliances are now being promoted, with special attention being given to electric dishwashers. Although few all-electric kitchens have been sold up to the present time, it is planned to go after this business by equipping three homes with completely modern kitchens for demonstration purposes. The utility does not plan any extensive promotion of electric ranges in this drive, because of the low-price competition of gas cooking.

Repossessed Models Appeal To Price Buyers

To attract the price buyers, much more in evidence this year, Maison Blanche, department store Frigidaire dealer, has had some success in advertising 1937 model repossessed refrigerators. This move was made, according to John H. Eberhardt, appliance sales manager, to attract the lower-income buyers away from the mail-order retail houses which have made large gains through their low priced boxes. In some cases, prospects were "sold up" to higher priced refrigerators, Mr. Eberhardt said.

This store has sold an average of 550 to 750 refrigerators a year over the last five years, and this year sales are up 15% over first-quarter sales in 1938. Since the refrigeration season here doesn't hit its peak until June, July, and August, these early figures were expected to be further improved.

Recently lowered electric rates in the area are expected to improve sales in all appliances for electrical dealers. Most important of these dealers, Mr. Eberhardt said, are the larger department stores, controlling most of the major appliance sales.

Trade-ins are carefully watched, to cut down possible losses involved. For four years the Maison Blanche has operated a "used appliance store," at a different location from the main store. Only used boxes in good shape are re-conditioned for sale in this outlet. Only a $500 overall loss has been charged to used boxes, whether they were sold or junked, the cost being less than $1 per used refrigerator taken in trade.

Small dealers were blamed for much of the trouble on high-priced trade-ins. Indication that they were taking a kicking on the deals was seen in the reduction of the number of small dealers. Influence on the control of the number of dealers by utility and distributor was cited as a factor preventing a mushroom growth of new small outlets.

Dept. Stores Seek Larger Discount

It is only in the last few years that the selling of refrigerators by department stores has been made at all attractive, in the opinion of D. H. Holmes Co., Ltd., General Electric dealer. The trend of trade away from the small dealer to the big department outlets has shown that these stores have seized upon new opportunities to increase profitable sales. But due to the rising cost of service and additional overhead items, it was believed that department stores should have a still larger discount spread.

Small as well as large dealers are voicing the opinion that they are tired of being no-profit retail outlets for manufacturers, according to this dealer. The need for a cheaper box—with a discount to make it worth the selling—was seen for standard brand dealers to meet the growing small income market demands.

Refrigerator business in the Holmes store has shown an improvement this year, and it was believed that, as the season got further along, real volume gains would be recorded all along the appliance line. Not much has been done on all-unit kitchens, but it was believed that, provided added promotion was supplied by the utility, distributor, and manufacturer, real volume could be realized. The local utility, it was said, does not promote any electrical appliances in competition with gas, with the exception of refrigerators.

On many kitchen and laundry appliances, the availiability of cheap domestic servants has slowed down sales. This is especially true of dishwashers and washers. Virtually untouched markets in these and other items not yet accepted by the general public were seen as putting new and profitable life in the appliance business—if they are aggressively promoted.

Dealer Sells Used Boxes For Customers

Vast advertising campaigns are now beginning to have their effect in educating the prospects who are buying electric refrigerators, says R. H. Richaud, appliance sales manager at Gruenwald's, Kelvinator dealer. The average buyer today, he says, knows a great deal about the size of the box wanted, the features of the box, and even is conversant with mechanical terms. This educated buyer is changing the sales methods, Mr. Richaud believes, and puts a premium on salesmen who can sell on product, and not on price.

Just as did the automobile business, the electric refrigerator business is not facing as its greatest problem saturation—but replacements, said Mr. Richaud. In meeting this problem, he has worked out a trade-in system that is solving difficulties very satisfactorily.

The store does not offer anything on traded boxes. In selling on trade, the price of the new box is kept at list—the salesman then offers to sell the old refrigerator, giving the customer to understand that much more can be realized by this method than by straight trade allowance. Boxes are sold to a regular dealer in this type of merchandise or through classified advertising. Mr. Richaud is very satisfied with the system, and believes that if all dealers came to an agreement on trades, or could sell them to a regular used outlet for base rates, much of the present ills caused by jacked-up trade-in allowances would be eliminated.

2-Temperature Models Boost Sales Figures

Household Appliances, Inc., new Stewart-Warner distributor for this area, reports that both retail and wholesale business is sharply up, following the introduction of the new two-temperature boxes. Most important note this year is the pulling power of the features included in the 1939 lines.

A great deal of advertising is done on new and different features, the main one being the "no de-frosting" claim of the higher-priced Stewart-Warner boxes. Many prospects, drawn in by such advertising, are sold according to the money they wish to spend, for the store, in recognition of the demand for lower priced boxes, has many economy models on display. Some 1938 General Electric refrigerators also are carried, as the company up to this year was a G-E dealer.

Montgomery, Ala.

After a number of pretty lean years spent in tooth-and-toenail competition with Alabama Power Co., dealers here are "taking over" the bulk of the appliance business, as the utility is turning from volume selling to extensive dealer cooperation.

There has been a steady decline in utility sales since 1933, and many strong dealer outlets have come into being since that time. However, the volume of sales in the "lush period," plus the many TVA boxes sold, has pushed the market saturation high, and replacements form a large part of the total business now being done.

Because this replacement business is a "profit robber," many of the leading dealers are turning to other lines of merchandise. Even though volume is reported to be up this year, many stores are filling out their appliance line with allied items, or taking on furniture or phonograph records to increase their dollar volume.

Losses on Trade-Ins Discourage Henley

Following this trend is the Henley Furniture Co., which has recently moved into new quarters from an exclusive appliance operation. Furniture is now the big noise, with refrigerators and other appliances chiming in with lesser volume. The move was made to compete on the same terms with the other furniture and department stores in the city. And—the store could no longer count on the profit return from appliance selling to pay selling costs and an operating profit.

No money is tied up in refrigerator stock, all sales being made on order this year. Sales are improving, up some 10% over the first quarter of 1938, and the outlook for the rest of the year was said to be "better than fair." Range sales are taking a real jump, and now count almost on a volume par with refrigerators.

Small dealers boosting the price of trade-in allowances have caused no end of grief, but many who have large amounts of money tied up in boxes that are not worth reconditioning, or are obsolete, are beginning to see where the profit leak is, and this, it is hoped, will bring about base rate allowance agreement.

Dept. Store Profits On Trade-In Deals

W. D. Parker, manager of the appliance department at Montgomery Fair, department store Frigidaire dealer, believes he has found a ready answer for the trade-in problem—so good that he welcomes trades as a source of new business. Now more than 60% of his business is in replacements, and no money is dropped on the exchange.

Mr. Parker has found one or two good outlets for all his used boxes, and after the refrigerators are reconditioned in the store's own service department they are sold to the used refrigerator dealers for a profit. Advertising is used to bring in the old units and many new unit sales are sold in this manner.

Dollar volume for the first four months of this year was up from $2,646 in 1938 to $4,232, as a result of the much greater demand for larger sized units. Eight-cubic foot refrigerators are being sold in quantities for the first time this season. Unit sales have increased from 65 to 75.

"Dealers would be wise in financing their own paper," Mr. Parker said, "because many people are becoming fed up with dealing with credit firms. We have found that by financing our own paper we can adjust our terms to the individual. 'Personalizing' the financing of refrigerators has become a big drawing card for this store."

Electric range sales have been slow, but big gains have been made in washers, with Bendix leading the

(Concluded on Page 11, Column 1)

How To Obtain More & Better Salesmen Is Biggest Problem In Birmingham

(Concluded from Page 10, Column 5)

list. The aggressive campaign of the local gas company has boosted gas range sales, but Mr. Parker believes that the setback is only temporary, and will easily be offset by increased promotion.

The tiny dealer who sells 15 or 20 refrigerators a year and cuts prices on the unsound reasoning that "because my overhead is small and my sales force small, I can afford to offer real bargains," has made the stabilization of prices a tough proposition for large dealers. "Dealers themselves cannot control this situation," said Mr. Parker. Distributors and manufacturers should come to the aid of dealers who are attempting to maintain prices.

Profits, Not Volume, Interest Tennille

No improvement in the refrigeration business is expected by the Frank Tennille Furniture Co., Westinghouse dealer. The store refuses to think of volume over profit, and because it will not cut prices and offer huge trades, many deals are lost.

Many sales are reported lost to electrical contractors, who, because they buy electrical supplies from some manufacturer's outlet, are enabled to get appliances at cost—or near cost—and resell them at no profit in order to get the wiring contract. Appliances, at cost, are held out as bait for profitable contacts, and regular dealers are left out in the cold.

Because a large part of the refrigerator business in town is being done by mail-order retail outlets, a sharp decrease in the number of sales of independent dealers' boxes was reported. This volume is gained, it was said, not only through lower prices, but also through different merchandising methods. Other manufacturers must take cognizance of the changing trend in appliance merchandising, this dealer believes, or suffer terrific losses in future volume.

Recognition of the change may lead to direct distribution of refrigerators and other appliances and a subsidization of a select group of dealers, according to this analysis.

Like other dealers, the Frank Tennille Co. has put more and more emphasis on such items as phonograph records, electric roasters, and attic fans. More profit per unit sale and the fact that an all-season line produces greater incomes for dealer and salesman have brought about the shift away from refrigerators as "the big and only profit item."

The unsettled dealer situation, and the realization that discount spreads were inadequate for good profit, has forced this dealer to look around for—and find—money-making substitutes, he says.

Birmingham, Ala.

A need for more and better salesmen is one of the biggest problems of dealers and distributors in Birmingham and surrounding sales territory as they swing into their big selling season this yer. With electric appliance sales expected to reach an estimated $6,286,100 on the lines of Alabama Power Co. and Birmingham Electric Co. in 1939, the hunt is on for men who can go out and grab a share of the improved business.

The two utilities and all local distributors conducted a sales training school this year to add real selling talent to the appliance business. The success of the first school in Birmingham, which received the enthusiastic support of the Alabama and West Florida Appliance Dealers Association, brought requests for similar sessions in Montgomery and Mobile. The added man power is expected to pump new life and dollar volume into appliance sales organizations.

For the first quarter of 1939, Birmingham dealers reported an 11% increase in electrical appliance sales over that period in 1938. Refrigerator sales were up 116 units over the 1,358 sold last year. Washers and ranges showed slight increases.

While sales were up and prospects good for dealers to cash in on big volume gains, "all was not as it seems," according to some appliance men, who registered plenty of kicks against factors that brought about a narrowing margin of profit. Outline of these factors would be a rehash of conditions that are dogging the tracks of dealers in many parts of the South and Southwest. Too many dealers—price cuts and high trade-in allowances—increasing demands for low-priced refrigerators—and a crying need for higher discounts to dealers, with control to insure fair profits.

Having the lowest per capita income of any state, and the lowest spendable income, Alabama, nevertheless, stands high in appliance sales. Dealers and distributors of electrical appliances now realize that they will have to compete harder than ever with other industries for the relatively small amounts spent each year for goods other than necessities. This tough scramble for the Alabaman's dollar has brought on a competitive battle of discounts and terms, but the move is definitely toward statewide cooperation.

Leaders of the cooperative move claim that the situation is coming around slowly, but that already the groundwork is laid for one of the strongest organizations of its kind in any state—or in any industry.

Why Good Salesmen Are Hard To Keep

"Sure, we dealers need good salesman, but the appliance business will have to be made a lot more attractive from an income standpoint to keep the good ones in the business," said Mrs. Mary D. Brightman, director of appliance sales for E. E. Forbes & Sons, Frigidaire dealer. Mrs Brightman believes that it is about time that manufacturers realized that good dealers are their "life blood," and so provide them with a dealer organization that is more select.

"Give the few good dealers more money to work with, and they will keep good salesmen making good money," she stated.

This year the Forbes Co. has returned to direct-mail prospecting. Most successful method used, however, is a clever system of appointing "proxy" salesmen to uncover prospects for regular salesmen. These undercover men get a regular commission for such sales.

Slight gains in major appliance sales were recorded for the first quarter of this year over last. Mrs. Brightman has a new sales supervisor this year, appointed in an effort to direct the sales campaign to "sell the products, and forget the price." She agrees with manufacturers and distributors that volume is the important thing for dealers. "But," she says, "we can't see any use in getting volume without profit. If we can combine the two, swell. If we can't, we'll take profit alone."

High Allowances Can Upset Applecart

One dealer in a town who insists on offering high trade-in allowances can upset the whole dealer applecart. And that, according to information supplied by the Carlisle Electrical Appliances Co., Westinghouse dealer, has turned what was an otherwise clean dealer situation into a wide open battle for lowest terms and highest trades.

All dealers must compete—up to a certain point—on these terms, for this year there are an increasing number of buyers who are "on" to the practice of dealers competing against themselves, and these buyers shop around until they drive prices down and trades up to a point where the deal is no longer very worthwhile for merchants who are at all interested in making money.

Another price knocker for standard brand dealers is the low-price mail-order house unit. Larger sales to low income buyers has thrown more and more business to these stores. The Carlisle Co. is using morning radio programs featuring special prices on used refrigerators and ranges to bring this bargain-hunting type of buyer into the store.

And now that the gravy has been taken from the refrigerator market, it is reported that it is a harder job to sell regular priced appliances. For this tough assignment, there is a lack of good salesmen, and this store is awaiting the outcome of the local training school to see if a good selling force can be obtained to overcome the difficulties involved in selling merchandise over price.

Bigger volume in electric range sales was predicted in this area, which has become well saturated on electric refrigerators. Combination sales in all-unit kitchenes and dishwashers, as a single item, were said to be poor. This was partly due to the cheap kitchen help available. Housewives who do not do their own kitchen work are not very good prospects for labor-saving devices. The same is true of laundry equipment in much of the Southern territory.

Former Dealer Outlines 'Downfall of Profits'

A disgruntled business man, who this year "gave up the ghost" on the appliance business, had plenty to say on the position of dealers in Birmingham. This man was one of the first distributors in the area, and after trying out and giving out in this end of the business, he entered the retail selling game.

He gave up this year because of a realization that there was no longer any money in what he called "giving away merchandise for a dollar bill." Contributing to the profit downfall here were depressed general business conditions, many strikes and layoffs in the steel and coal mining industries, and the practice of many dealers selling to poor accounts.

This brought about a wave of repossessions, he claimed, and a general glut of the refrigerator market. Then came wholesale selling, pushing dealers further into the mire. Distributors admitted that a dealer today was "pretty lucky" to eke out 5% on refrigerator sales. What did distributors do to curb the fall of prices and profits? Nothing, because they are always glad to put up with dealers "killing themselves off" as long as the volume line keeps moving up.

Top Salesman Explains His Point of View

And now the salesman's side. A. J. Stern, a salesman for Flint Refrigeration Co., Frigidaire dealer, and a B.T.U. Club (top Frigidaire salesmen) member since 1934, unloaded a batch of troubles that bedevil salesmen in the local area.

Mr. Stern said that no longer could a good salesman hope to realize a good income, because he had to give away most of his commission bargaining against competitors. Every possible evil exists in the local appliance business, and many good salesmen are already out and working at something more profitable, said Mr. Stern.

"And that is the reason they want more salesmen," he observed. "Most of the good ones have seen the light and left."

Eleven New Distributors Named By Evanoil

DETROIT—Eleven new distributors have been appointed by the Evanoil division of Evans Products Co. They are:

Listenwalter & Gough, Inc., Los Angeles; Baltimore Gas Light Co., Baltimore; Joseph Strauss Co., Buffalo; Herr & Co., Lancaster, Pa.; Electric Supplies Distributing Co., San Diego, Calif.; Townley Metal & Hardware Co., Kansas City, Mo.; Kretchmer-Tredway Co., Dubuque, Iowa; Hunter Bros., Fayetteville, N. C.; Janney-Semple-Hill Co., Minneapolis; Jacobi Hardware Co., Wilmington, N. C.; Howden Coal & Oil Co., Savannah, Ga.

'Austin Electric' New Name Of Lake Winola Shop

LAKE WINOLA, Pa.—Name of Lake Winola Service Co. has been changed to Austin Electric Service, reports Charley Austin, partner in the firm, and the company will maintain another shop at Pittston, Pa.

C. P. Cole Establishes Own Business

SCRANTON, Pa.—C. P. Cole, formerly connected with Trilling & Montague, Norge distributor with headquarters in Philadelphia, now is in the refrigeration installation and service business for himself here.

AIR CONDITIONING & REFRIGERATION NEWS

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Display vs. Storage Of Frosted Foods

ELSEWHERE in this issue (page 13) is published another letter from C. S. White of C. V. Hill & Co., arguing the merits of display cases over blind storage cabinets for the retailing of quick-frozen foods.

Mr. White, in common with Paul Sullivan of the Commercial Refrigerator Manufacturers Association, has been considerably exercised over the publication on this page of an editorial, "Quick-Frozen Foods Aren't Displayed at Present."

This editorial expressed the surprise of the editors that comparatively few display cases are being used by retailers of quick-frozen foods, and then quoted R. E. Smithson (who was at the time commercial refrigeration sales manager for Frigidaire) as to several reasons for this situation.

Perhaps There's an Opportunity In Present Situation

After quoting Mr. Smithson, the editorial ventured the thought that perhaps producers who were seeking to gain a foothold in this business might do so by recommending and helping their retail outlets to acquire display cases for these foods.

The resentment of men like Mr. White and Mr. Sullivan at Mr. Smithson's remarks, however, has served to reopen the question, and to bring out considerable information on the subject (and, incidentally to give the display case people some free advertising).

Richard Poole Relates Birds Eye Experience With Cases

A fortnight ago Richard Poole, assistant operating manager for Birds Eye, addressed the Detroit section of the American Society of Refrigerating Engineers on the quick-frozen foods business, and in a question-and-answer session, shed the following light on the subject:

Q. "Why do you permit your retail outlets to put Birds Eye Frosted Foods only in the blind storage cabinets which you lease to them?"

A. "Because our experience shows us that that is the most satisfactory method. The machines and cabinets meet our tests, and we keep them serviced. That way we know our foods will be refrigerated properly. Unless an unbroken line of zero temperatures is kept from freezer to consumer, quick-frozen foods are no better than the slow-frozen variety."

Q. "Wouldn't you sell more goods if display cases were used?"

A. "Our tests show that there is practically no difference in the sales volume when a display case replaces a storage cabinet."

Q. "Are present-day display cases entirely satisfactory with regard to such previous handicaps as frosting of the glasses?"

A. "Display case manufacturers say they are. I wouldn't quarrel with them. However, I think there is room for reasonable doubt on this score."

Birds Eye Has Big Stake In Storage Cabinets

In rebuttal, some of the display case people say privately that Birds Eye has an enormous investment in the blind storage cabinets which they lease to retailers, that the leasing of these cabinets is profitable, and that if they introduced display cases into their retail picture now, the demand for them would be so great as to force the junking of the blind storage cabinets.

The display case people also insist that those who advocate the storage cabinet simply haven't solved the problem of making satisfactory low-temperature display cases.

Just who is right or who is wrong in this controversy, of course, can only be demonstrated by further experience. Obviously each side has an axe to grind. The NEWS, of course, doesn't care which direction the procession moves. Its only interest is in presenting the facts, whatever they may be. And the facts in this case are that "quick-frozen foods aren't being displayed at present"—at least, to any great extent.

Display Cases May Have Good Future In This Business

It should not be inferred from this that low-temperature display cases may not come into prominence in the future. Other things being equal, one would naturally expect displayed products to have a distinct advantage over those "in the cracker barrel." Display is one of the first principles of merchandising in any line.

And some day, no doubt, the cost of low-temperature display cases will be reduced, former objections to their operation will be answered, and the manufacturers of these improved display cases will be so confident in their products that they will go out and do a job of selling them to the refrigeration and food industries.

As matters stand now, there seem to be few well-organized plans to merchandise low-temperature cases. Manufacturers of cases have leaned so heavily on the quick-frozen foods producers to promote the sale of low-temperature equipment that the largest producer in the quick-frozen foods field took matters into its own hands, set up its own exclusive manufacturing plant, and now leases these cabinets to food retailers.

Other producers have helped sell cabinets to their retail outlets, usually demanding a "rake-off" for their efforts. Only sporadic attempts have been made by the case people themselves to build up aggressive distribution for their products, and actively sell low-temperature equipment to food retailers.

They'll Do It Every Time . . . By Jimmie Hatlo

LETTERS

Sweeney Commends 10-Year Sales Graph

Appliance and Merchandise Dept.
General Electric Co.
Specialty Appliance Sales Division
Nela Park, Cleveland, Ohio

Editor:

Allow me to congratulate you on the printing of the graph which appeared on page 11 of the recent issue of AIR CONDITIONING & REFRIGERATION NEWS, showing the record of household electric refrigerator sales by months from 1930 to date. The convenience of such a graph is appreciated by the writer, and we know that it will be of value to us.

A. M. SWEENEY, Manager,
Domestic Refrigerator Sales Section

Thousands of Reconditioned Meters

The Brunswick-Balke-Collender Co.
623 S. Wabash Ave., Chicago

Sirs:

In your April 5 issue, you have inquiry No. 3370 from a dealer in Maryland who wishes to obtain some reconditioned coin meters. Therein, you refer the inquirer to the International Register Co.

For your information, The Brunswick-Balke-Collender Co. has several thousand of these items which we are willing to dispose at attractive prices, in case this may be of interest to your readers.

J. L. BURGESS,
Director of Purchases

A Tough Gang To Get By

Charles F. Dowd, Inc.
Richardson Bldg.
Toledo, Ohio

Advertising Manager:

Thanks a lot for writing me and explaining about the Standard news stories. As a matter of fact, I think your editors have the right slant on the kind of pictures to use, particularly in a book like yours.

I notice that individual pictures used show the man at work in his office and not just straight portraits. As we get farther along, maybe we can send you some pictures of the kind they like to run. I am also in favor of a book that keeps the advertising and editorial departments separate—not because it makes it tough on you, but because I think it's really the right kind of editorial policy.

Anyhow, I do appreciate your trouble in giving me the whole low-down. I also realize that when you have guys from the University of Illinois to deal with it makes it a bit tough to get stuff by, as they have always been a hard gang.

CHARLES F. DOWD

Note: We understand Mr. Dowd hails from Ohio State University.

105% Support Pledged By 'Sandy' Pratt

California Refrigerator Co.
1077 Mission St.
San Francisco, Calif.

Publisher:

We are returning your "Special Bulletin to Jobbers" dated May 16, and you will see that we have not a great supply of your manuals and other books on hand, for we are very happy to say that we sell a great many of them.

We are always glad to work with you, and we do enjoy selling all your publications, including the NEWS. Whatever your plan is, count on us to work with you 105%. We like the whole gang on the NEWS, including yourself, but most of all we feel that the NEWS is doing more to build up the refrigeration and air-conditioning business than any other channel or means in the whole world. We are taking in a lot of territory and making a very strong statement, but there is no doubt in our minds that through your newsy magazine, the industry as well as a great part of the world, are getting the true and helpful facts of our fast growing enterprise.

CLARENCE F. (SANDY) PRATT,
President

Refrigerator Car For Grapes In India

The Outram Private Hotel
Outram Road, Fort,
Bombay, India

Editor:

I wonder whether you will remember me, but I am the man you discussed refrigeration matters with—among them the "Z" process—when you were in Bombay some years ago.

In your issue of Nov. 2 last—page 12—top left—there appears a short article describing a Holdover Plate-Type Truck Cooling Unit developed by McFarlane and Mills.

I want a suitable plant, apparently of this type, to cool a Railway Van—size 24 feet long, 8 feet wide, and 8 feet high—having 3 inches of Kapok insulation. This van will carry "Z" Quick Chilled Grapes a distance of 1,800 miles. The outside temperature varies from 95 to 103° F. and the journey will take from four to five days. The temperature desired in the van is 32 to 35° F., and the quantity of fruit carried will be about 10 tons or 2,240 lbs. each.

Also for carrying fish in a similar railway van, but in a cabinet only occupying a portion of the van, I require to cool 50 to 100 gallons of brine (salt and water) to 28° F., the tank containing the brine has 4 inches of cork slab insulation, and the outside temperature is as given above.

When I occupy the whole van, I am permitted to install my own power unit which will be a small Deisel engine, but when I only operate a cabinet installed in the van, and only occupy a portion of the total accommodation, I am compelled to take my power from an axle drive.

For both of these propositions I would be very interested to have the fullest possible information regarding cost of unit, whether McFarlane and Mills can supply from stock, and whether they are represented in India, and if so by whom? When they quote please ask them to include packing for export charges, if any, or better still ask that they quote f.o.b. U.S.A. port. From the brief description in the NEWS I think this unit is just what I am looking for and if it is I hope to be able to use a number of them.

Another matter on which I would like to ask your opinion is that of locker storage plants. My idea is to place lockers having a capacity of from 400 to 600 cu. ft. on small coastal steamers not equipped with cold storage space. The shipping companies will provide current, and I was to consider using a unit of the holdover type for this job if you consider it suitable. The lockers should have 3-inch insulation and would operate at 28° F.

I trust this inquiry will not unduly inconvenience you but I cannot trace McFarlane and Mills address in any copies of the NEWS that I have in my office.

Cold storage is advancing slowly in this country and I may be able to send you some very interesting details of certain operations which I am now undertaking. I have formed a small company—The Bombay Quick Freezing Food Refrigeration Co.—using "Z" Process—and the results although in a small way are very encouraging. The trouble here is to get Indian capitalists to understand why they cannot get 100% dividends in three months.

G. AZRILENKO

Subscribers Speak

Montreal, Quebec
3225 St. Catherine St., E.

Editor:

Enclosed you will find a money order of $2.00 for which send me the two Commercial Service Manuals C-2 and C-3.

As my work is servicing ice cream cabinets, I find the Servicing Column of your paper very helpful, as it may be adapted to various models of nearly the same type.

DOUGLAS HYATT

229 W. State St., Springfield, Mo.

Editor:

Please send me C.O.D. the six volumes of Air Conditioning Made Easy by F. O. Jordan, listed at $1.00 per volume in the list of books and magazines given students by Refrigeration & Air Conditioning Institute of Chicago.

Would also like to congratulate you on the NEWS, it's great.

KENNETH A. SCOTT

Farrell Refrigeration Co.
229 N. E. Dallas St.
Camas, Wash.

Editor:

Having read the two manuals Nos. 3-4 Household Refrigeration that arrived yesterday, I must agree they are splendid and I now would like manuals No. 1 and 2 Household and No. 1 Commercial. Please send them C.O.D.

R. C. FARRELL

Quick Frozen Foods

Frosted Foods Sales Helped By Use of Display-Type Case, Hill Official Says

C. V. Hill & Co., Inc.
Trenton, N. J.

Publisher:

Although I still do not agree with your original editorial entitled "Quick Frozen Foods Aren't Displayed at Present," your letter of May 11, also your published answer to my reply, I do appreciate the publicity you are giving to all sides of this controversy and also the photograph you published of our own display case. Since your letter and published reply asked certain questions of me, I am now taking this opportunity to answer them.

First, you say, "Looking at the leaflet attached to your letter, it appears that the 'self-contained combination display and storage frosted foods cabinet' which you are featuring actually supports, rather than refutes, the trend reported in the editorial." Yes, your editorial did make sort of an apology in the last paragraph by saying that new food producers may get a toe-hold in the frosted food industry by using display cases and your editorial writer thus admitted that the display case has more sales appeal.

IMPORTANCE OF DISPLAY

However, and this is the point I object to, the main impression and argument of the entire article was to the effect that no display is necessary to sell frosted foods. Its very headline, "Quick Frozen Foods Aren't Displayed at Present" says as much even though it is factually wrong. Again, in the beginning it poses the question "What's happened to the display case?" and it follows through by arguing that "Ice cream experience shows the way." These quoted words having appeared in bold face and having been followed by the explanation that storage cabinets without any display whatever should be satisfactory for frosted foods because they already have been adopted for ice cream.

Your article did actually convey the impression that no display is necessary, the fallacy of which I argued against in my letter of May 2. In your reply, you challenged me again by asking if we have any records to prove that the most profitable merchandising of frosted foods is being done by merchants who use display equipment. Yes, we have. I know of a number of merchants using display cases who are selling more than $200 worth of frosted foods per week, although I happen to know of none who are selling this much from blind storage cabinets. I know of one man in Ohio who operates two stores, in one of which he sells frosted foods from a blind storage cabinet and the other of which he sells frosted foods from a display case, the latter of which outsells the former by a wide margin.

LEADS IN SALES

Before deciding to enter the frosted food equipment business one of our prospective competitors made a survey of several hundred stores to decide whether he should build a display case or storage cabinet. He reported that the display cases outsold the storage cabinet almost 2 to 1.

To illustrate what merchants think about display, I'll site the experience of Chandler & Rudd of Cleveland, Ohio. This old-established retailer sells frosted foods from a blind storage cabinet furnished by the Frosted Food Sales Corporation. Our Advertising Manager, who visited this market, advised that the top lids of the cabinet in question were replaced with sheets of plate glass so that the customer could look down and see the merchandise below. A clerk in the market advised that after this was done, frosted food sales increased slightly.

No less of a retail authority than Gerritt Vander Hooning, President of the National Association of Retail Grocers, purchased a Hill display case for frosted foods, of which he said, "Any grocer knows that display is one of his best salesmen, it is indispensable. I would not attempt to introduce a product without it—certainly not a relatively unknown product such as frosted foods."

Hector Lazo, Executive Vice President of the Cooperative Food Distributors of America, is another authority who agreed with this point of view, having said, "There are any number of companies building serviceable equipment and you can get a cabinet costing at a beginning price of $300. These cabinets answer the purpose, but require the customer to do the selling job himself. He can't rely on the customer knowing that the cabinet over there is for frosted foods." We are not concerned with the technical side of freezing as the retailers' problem of selling, nor do we contend that a display case would do the whole selling job, because proper merchandising methods on the part of the merchant are very essential. However, we know that the sales possibilities are far greater with display than without it.

ATTRACTIVE PACKAGING

It is no wonder that display increases the sale of frosted foods. Display is the most important sales force in the retail food store, despite the fact that your editorial naivly claims that, "There is nothing attractive about a frosted food package." Ignoring the reflection made by you against certain frosted food companies who have taken pride in their package designs, I might point out that there is no reason why a frosted food package cannot be made attractive as a can on the shelf. Now, there is not a single manufacturer of canned foods who does not consider display space of value in the store. A survey made by the *Progresive Grocer* some years ago, shows that the display, on the average, increased the sale of cans and packages by over 40%. Furthermore, the attractiveness of frosted foods on display in a refrigerated display case can further be improved by opening some of the packages. We agree that it is not necessary that the packages be sold from the display compartment, but it can be used very effectively in developing new frosted food customers as suggested in my letter of May 2nd.

One more thing. You have asked point blank, "Is it not true that open frosted food packages will become deteriorated by exposure to the light?" It is true that some foods do fade slightly on exposure under light, but the trouble has been grossly exaggerated. They do not fade. discolor or spoil nearly so rapidly as do fresh foods. Every good butcher will change the display of meat at least once every twenty-four hours, whereas most frosted foods need not be changed more than once a week, except for the psychological affect it has from a merchandising standpoint. The value of the display far outweighs the cost of occasionally changing packages.

C. S. WHITE

REA To Finance 300-Locker Plant In Camilla, Ga.

CAMILLA, Ga.—An allotment of $25,000 has been made by Rural Electrification Administration for construction of a 300-locker cold storage plant here.

The plant, second such project financed with REA funds, will include a chill room, sharp freezers, and lard rendering equipment. It will be operated as a cooperative, members of which are also members of an REA power cooperative.

Jury Decides Newark 'Air Conditioning' Performance Case In Distributor's Favor

(*Concluded from Page 9, Column 5*)

jury and the judge (the judge mentioned it in making his charge to the jury), and that was:

"If I were to buy a $16,000 automobile I would certainly hire a chauffeur to drive it, and see that he were given proper instructions on how to take care of it. I think the same thing applies to a $16,000 air-conditioning system."

Counsel for the plaintiff asked if such instructions should not be written, and while admitting that they would be better written, the witness declared that as long as there was an understanding of the instructions by an employe with proper authority it would be sufficient.

When John Hayn, service manager for the installing firm, was placed on the stand, the plaintiff's counsel called for a record of the service calls on the job. Some 30 calls were shown for the period from May 30 to Oct. 15, but Mr. Hayn testified that this number was not overly excessive for a job of this magnitude.

The contract called for a 15° temperature differential from the standard outside design condition of 95° F. dry-bulb temperature and 50% relative humidity. The counsel for the defense was careful, however, to have its "experts" testify that good practice was not to maintain this differential at all temperatures, that the differential scaled down as the outside dry-bulb temperature dropped.

There was considerable controversy over the construction of the duct-work, experts for the plaintiff claiming that it was sized too small and that there were right angle bends. However, no conclusive evidence was offered as to just how much, if any, such construction limited the air distribution. The specifications called for vanes on the right angle bends, and there was a dispute as to whether such vanes had been installed, the sheet metal contractor who did the work testifying that "to his knowledge" they had been installed.

The judge, however, would not allow the sheet metal contractor to testify that the right angle bend construction was good practice, on the grounds that he wasn't properly qualified. All he could testify, said the judge, was as to what had been done, and whether it had been done in a workmanlike manner.

Both sides presented some layman witnesses to give their opinions on whether or not the system "was giving off cooling" (the phrase used throughout the trial in reference to whether or not the air-conditioning system was working).

The defendant's witnesses seemed to be a little more effective in this respect, particularly as concerned a barber shop proprietor who was considering the purchase of air conditioning and who wanted to see what one would do. He declared that he had entered the premises of the plaintiff and found conditions quite satisfactory, and the way he would have liked to have had them.

Also produced by the defendant were some law clerks who had obviously gone to the Novelty Bar & Grill to make a report on conditions. They read from written reports, but their testimony, from an observer's standpoint, was not so effective with the jury.

The witnesses that the plaintiff produced to testify as to conditions were more numerous, but in most cases they were proved to have some more or less close connection with the plaintiff. A couple of bartenders testified that the alleged failure of the system to work properly had driven away some customers, but under cross examination they were unable to give the name of any of the customers who had left because of this.

The plaintiff's failure to produce any witnesses to testify as to conditions on the night of the big opening June 20 (when the plaintiff claimed conditions were so bad) was brought out by the defense counsel.

No evidence whatsoever was produced that either side in the case had taken temperature readings with recording instruments, or any other type of specific proof as to conditions.

Development of Refrigerated Trucks Has Been Painful, Painstaking Process

G-E Engineers Analyze Difficulties and Present Solutions to Truck Unit Design

HERSHEY, Pa. — Stepped up needs of both the ice cream and quick-frozen foods industries have accelerated the development of refrigerated truck bodies, A.S.R.E. members were sold by H. M. Harrington and L. M. S. Cooper of the transportation department of the General Electric Co.

The first application of a specially designed body for refrigerated trucks was made in metropolitan areas about 1916. This consisted of a square, box-like open top structure, divided into three compartments. The cans of ice cream were stacked in one compartment with loose ice and salt.

Such a body, mounted on a 5-ton truck chassis, would carry approximately 400 gal. of ice cream which, with the ice and salt for cabinet service, represented a gross weight of approximately 43 lb. per gal. of ice cream.

WEIGHT REDUCTION

Modern equipment, including mechanical refrigeration, is as low as 16 lb. gross weight per gal., or a reduction of 63%.

About 1922 came the first development of a closed type body.

This was also a square box-like structure, but provided an enclosed partially insulated compartment for the ice cream load. This compartment was refrigerated by means of an ice and salt brine tank in the ceiling.

It was still necessary, however, to carry large quantities of ice and salt for servicing the store cabinets, and the improvements represented were principally the easier and cleaner handling of the ice cream with perhaps some slight saving in refrigeration cost.

NEW DESIGNING

Later, with the introduction of the mechanically refrigerated retail cabinet, the ice cream manufacturer was relieved of servicing the retailer with ice and salt. The delivery body could now be designed for the sole purpose of transporting the ice cream.

Extensive changes then took place in truck body design, the authors pointed out, and several methods of refrigeration were introduced, principal among which were:

1. Ice and salt pack.
2. Cartridge or Cold-Can system.
3. Mechanical refrigeration (several forms).
4. Dry ice.
5. Eutectic or "hold-over" system.

ICE AND SALT SYSTEMS

"The ice and salt systems represented the first version of the modern type of insulated body," they declared. "It consisted of one or more insulated compartments for the ice cream and usually a non-insulated compartment for the return of empty cans. Refrigeration was provided by an ice and salt brine tank usually constructed to form the ceiling of the compartments.

"The principal improvements represented were the reduction in gross weight of equipment and non-revenue load, and better arrangement of body to facilitate more efficient and easier handling of the pay load.

"The disadvantages of the ice and salt pack were the cost of packing the body with ice and salt, the rapid deterioration of body and truck chassis due to corrosive effect of the salt brine, the undesirable discharge of salt brine about the streets, plant, and garage and the fact that the refrigeration capacity diminished toward the end of the day.

BRINE CARTRIDGE

"To eliminate the ravages of the ice and salt brine tank, and offer advantages of a cleaner truck with increased life of truck and body equipment, the brine cartridge system was developed," they continued. "This used a sealed metal container filled with a eutectic solution having a freezing point of —6° F. The containers, or "cartridges," were frozen in the plant hardening room. Racks were installed in the top of the truck body to load a sufficient quantity of cartridges to provide refrigeration for the normal day's operation.

MEANS OF COOLING

"Refrigeration was effected by means of the latent heat of liquefaction of the frozen eutectic solution, which would absorb approximately 100 B.t.u. per lb."

Disadvantages of this system were: first, the necessity of providing facilities for freezing the cartridges; second, the cost of handling them to and from the truck; and third, the fact that where cartridges were used to refrigerate the retail cabinets, large quantities had to be hauled for this purpose. All retail cabinets had to be serviced regularly regardless of sales.

MECHANICAL METHODS

"With the rapid development of mechanical refrigeration, about 1930 to 1931, a number of pioneer installations were made on refrigerated truck bodies, principally by operators. However, few of these met with much success, and considerable prejudice was established against mechanical refrigeration, particularly with a power take-off drive.

"Two arrangements of this drive were used to some extent; one, with the gas engine belted directly to the compressor unit and with means for disengaging it to permit electric motor drive when at the plant. The second arrangement consisted of a small engine generator power plant to deliver electrical energy to the motor on the condensing unit. In most cases these were manually controlled, although some were provided with self-starters and control was automatic.

"Finned coil evaporators supported from the ceiling of the refrigerated compartments were commonly used. With these problems of frost accumulation were encountered, and frequent defrosting was necessary.

"While these equipments provided the desirable refrigeration characteristic of maintaining full refrigeration capacity through the entire delivery period, numerous problems were encountered with the gas engine, the overall cost and weight of the equipment were excessive and its size necessitated utilizing a considerable portion of the main body for its installation.

POWER TRANSMISSION

"Many schemes have been tried in an effort to obtain a practical and reliable means of transmitting the small amount of power required for the condensing unit from the truck engine. From a study of the truck engine it was obvious that there were just two points from which an auxiliary drive might be taken; from the crank shaft extension on the front end of the engine or from a transmission power takeoff (PTO).

"The engine crank shaft extension offered two possibilities for driving an electric generator. A number of installations were made mounting the generator out in front of the truck between the radiator and pumper, direct connected to the crank shaft.

OTHER METHODS

"Others mounted the electric generator underneath the hood supported from the engine block and belted to the crank shaft extension.

"The former of these afforded good ventilation to the generator, but placed it in a rather vulnerable position in case of accident; the latter subjected the generator to high ambient temperatures and presented numerous difficulties to the installation of a satisfactory belt drive.

"On the other hand, all commercial truck transmissions are equipped with a standard S.A.E. opening in the side of the transmission case. An auxiliary gear box (a PTO) is bolted into this opening and its gear engages one of the countershaft gears in the main transmission."

FIVE PRINCIPAL SCHEMES

In taking power from this source there have been five principal schemes of transmitting it to the compressor. These were described briefly as follows:

1. An alternating current generator delivering power to an a-c motor. The generator may be mounted in the chassis frame and only wires need be carried from the chassis to the body. This facilitates automatic or thermostat control of the refrigerating unit.

2. A direct current generator delivering power to a d-c motor. This scheme accomplishes the same as the a-c generator with the additional advantage of providing some speed correction, but with the disadvantage that it usually required a dual a-c and d-c motor on the compressor.

3. Direct mechanical drive has been used by bringing an auxiliary drive shaft back from the PTO to a journal bearing and pulley directly beneath the front end of the body and belting up through the floor to the compressor. In some cases a two-speed PTO was utilized in order to obtain more satsifactory compressor speeds when operating in the city or open country. This, however, carried a distinct hazard in that the driver may unintentionally leave the PTO set for slow speed city running and over-speed the compressor at higher truck speeds on the open highway.

4. A very few installations of a hydraulic type of drive were made. This consisted of a clutch of the hydrostatic gear type which transmitted practically direct drive up to a certain speed above which the slip increased to limit the compressor speed to a safe value. The slip, of course, represents a direct power loss.

5. Some slight attempt was made at a direct mechanical drive to the compressor through an eddy current slipping clutch. This was designed to afford speed corrective characteristics similar to the hydraulic weight, cost, and prohibitive losses.

6. Direct mechanical drive through a magnetic clutch. This system seemed to offer real possibilities, and has been developed and extensively used.

SHIFTING GEARS

"The principal obstacle to the success of the various PTO drive systems was the interference of the drive with the normal functions of gear shifting. To shift gears as required in the normal operation of the truck a very exacting technique was necessary.

"To eliminate this obstacle requires that the compressor drive be disconnected during the normal process of shifting gears and that the rotational inertia effect of that portion of the drive which is permanently connected to the transmission (between the transmission and disconnecting clutch) be extremely small.

"The electric driven equipments were heavy and involved complexity of control with which the average garage or refrigeration service man was not trained to cope. The result was that for the need of very minor adjustments, serious interruptions of refrigeration were encountered.

TOO MUCH WEIGHT

"Furthermore, most of them were adaptations of standard commercial apparatus which was not designed for minimum weight and space requirements so essential in automotive equipment. Consequently they required a compartment space which constitute a loss in pay load capacity.

"With the difficulties of the ice and salt pack and early attempts at mechanical refrigeration fresh in mind, the commercial introduction of dry ice was heartily welcomed. Both manufacturers and operators turned to this mode of refrigeration as a panacea for their truck refrigeration problems. It was outstanding from the viewpoint of cleanliness, simplicity, and light weight.

"The characteristics of dry ice refrigeration were well adapted for ice cream delivery work, it evaporated at extremely low temperatures, produced better than twice the B.t.u. per lb. of ice and salt and totally eliminated the heavy tanks and destructive effect of the salt brine.

DRY ICE COOLING

"Three principal methods have been used in applying dry ice refrigeration to truck bodies. At first the dry ice was merely placed in the compartment, lying on top of the cans. This method naturally gave very poor temperature distribution, inefficient use of the ice, and froze can lids on so tightly that the drivers could not remove them.

"One of the early attempts at controlling temperature consisted of a strong cast aluminum tank which was supported from the ceiling. A pressure relief valve was provided to control the pressure created by the evaporating ice to a predetermined value and thus control the temperature.

"The dry ice plate system has been applied extensively and is used today on practically all bodies using dry ice refrigeration. An aluminum plate is installed in the top of the refrigerated compartment, and is designed to have adequate conductivity to provide a fairly uniform temperature over its entire surface.

"The cake of dry ice is placed on top of the plate at the center. More uniform temperature distribution over the plate, and a degree of temperature control are obtained by placing an insulated pad between the cake of ice and the plate.

"The principal disadvantage is the high cost of dry ice, particularly in localities remote from the source of supply.

"It also has the characteristic of diminishing in refrigeration capacity throughout the delivery period, so that refrigeration may be practically gone at the end of the route when it is most needed.

EUTECTIC HOLD-OVER

The eutectic hold-over system is a combination of the brine cartridge and the mechancial refrigeration system. The cooling unit consists of a flat tank containing evaporator coils and a eutectic brine solution. This combination permits the freezing of the eutectic solution in the truck body.

The condensing unit may be mounted on the truck body or as a separate portable unit at the plant garage equipped with flexible hose for connection to the truck body. Both systems are in general use.

"The system with the condensing unit in the truck body is the more flexible for the reason that it may be connected to any a-c power source, facilitating application of the truck to routes requiring two or more days away from the plant.

"Furthermore, with the condensing unit in the truck body there is the opportunity to employ a power take-off drive.

"These same cooling units may also be arranged with make and break valves and flexible hose connection to use the plant ammonia system for their freezing.

ADAPTED TO LARGE PLANTS

"This system is especially well adapted to large plants in metropolitan areas where adequate plant refrigeration capacity is available without additional investment. It is also particularly suitable for large fleet operation where a number of trucks can be refrigerated from a single refrigeration plant.

"A slight economy is realized through the higher efficiency of the large refrigeration plant in comparison to the individual condensing unit on the truck, also from the reduction in equipment weight.

"This difference in first cost is partially offset by the higher cost of making the hose connections compared to simply plugging in an electrical connection."

MARKET RESEARCH

In 1936 a market research investigation was made to determine the demand for refrigerated truck bodies, as well as the variety of requirements. There are two general classifications, the low tempertaure or zero body for ice cream and frozen foods, and the so-called high temperature, or 40° F., body for semi-perishables.

The ice cream business is at its maximum during the hottest weather. At this time the delivery service and refrigeration requirements are at the maximum.

To determine the refrigerating equipment capacity for a given design of body, the sum of practically all the maximum heat gain conditions should be taken into consideration.

A typical example of these maximum conditions is as follows:

Day Load

Temperature differential	100° F.
Insulation leakage per hour including average effect of solar radiation, B.t.u.	1,500
Load per door opening, B.t.u.	100
Insulation leakage, 15 hrs., B.t.u.	21,500
150 door openings, B.t.u.	15,000
Hot can load, B.t.u.	5,000
Total heat load, 15 hrs., B.t.u.	41,500
Average heat load per hr., B.t.u.	2,770

Night Load

Temperature differential	90° F.
Insulation leakage, B.t.u. per hr.	1,200
Insulation leakage, 9 hrs.	10,800
Door opening load, B.t.u.	3,000
Total heat load, B.t.u.	13,800
Total day and night load, B.t.u.	55,300
Condensing unit capacity (for 9 hours night operation only)	6,150 B.t.u. per hr.

(Concluded on Page 15, Column 1)

Canadian Pacific Engineer Advocates Use of Overhead Bunkers on Cars Which Refrigerate Perishables

HERSHEY, Pa.—Use of overhead bunkers as a practical and economical means of improving the efficiency of railway refrigerator cars, and thus lowering handling costs of perishables, was outlined for members of American Society of Refrigerating Engineers by O. C. Walker of Canadian Pacific Railway, Montreal.

Canadian Pacific has been experimenting with refrigerator cars for the past 28 years, Mr. Walker said, employing three main types: the Moore car in 1911, the A.B.C. system in the years 1918 to 1923, and the roof tank system during the past two years.

Present overhead-bunker method used by the company is the result of experiments with 10 cars built to carry eight overhead tanks, based on a system developed by engineers for the South African State Railways.

The underside of these tanks forms the inside ceiling of the car, and provides approximately the same absorption surfaces as the original brine tank general purpose cars. Nine of the cars are closely modeled on the South African pattern, but Canadian Pacific engineers added to the tenth car baffles under the tank surfaces, and a duct connecting with the baffles, enabling the use of convection currents and improved air circulation, Mr. Walker said.

BASED ON EXPERIMENTS

After successful road tests of the equipment last year, an additional fleet of 50 overhead-bunker type units was built by the railroad.

"One of the most important problems dealt with was that of insulation," Mr. Walker said. "In view of the requirements of frozen traffic, such as meat and fish, and the newly developed quick-frozen materials, the overhead car was provided with 5 in. of hairinsul in the roof and floor and 4 in. in sides and ends.

"Our mechanical engineers describe the constructional details of the 50 cars refered to as follows:

"The steel underframe is of conventional type similar in sections and general dimensions to that of a modern box car. The open frame superstructure is of steel with corrugated steel ends, the whole mounted on cast steel pedestals, connected at the bolsters, cross-bearers, and center sills, thus permitting blanket insulation of the main superstructure.

"The eight overhead ice containers are of special alloy steel to resist corrosion, and are so designed as to form an integral part of the superstructure and yet may be readily removed for repair. These containers are interchangeable.

"Blanket insulation is used throughout, 5 in. on the roof and floor, 4 at the sides and ends, and is applied from the outside. The inner layer at the sides is protected by a waterproof covering secured to the framing posts.

ROOF CONSTRUCTION

"The roof is steel of rigid construction, supported at the eaves on a wood furring secured to the superstructure. Hatches are provided on the roof for the filling of the ice tanks. The hatch covers are of the same alloy steel as the tanks. The outside sheathing is 13/16 T.&G. nailed at the eaves furring and on girths, secured with stud rivets to the superstructure.

"The inside finish provides an air circulating flue under the tanks and down the side walls of the car. The side lining and ceiling under the tanks is of T.&G. or plywood nailed to furrings and protected from condensation by a waterproof covering.

"The floor is 1½ T.&G. secured by bolting at the inner side sills and by spiking to a center stringer. The floor is also protected by a cemented waterproof covering, and is provided with four drains.

"The floor racks are of composite construction, pressed steel transverse stringers and longitudinal wood slats. They may be raised for cleaning or removed for repair. Air spaces between the slats permit circulation through the load. The meat racks are wood carried on special tubing, supported at the sides and center of the car. They are designed to be removed in sections, to give access to the ice tanks.

"Two cars only differ from the general description. One is similar in all respects except the outside sheathing which, on this car, is of light gauge alloy steel built in panels and assembled by welding. The other exception is of entirely different construction. A steel superstructure sheathed with light gauge alloy steel is mounted directly on the underframe and insulated from the inside of the car.

INNER FRAMING

"A light inner framing to carry the meat racks and inside finish is suspended from this superstructure by means of offset connections at the side plates. Similar connections at the side sills support the floor. The main difference in this car is in placing of the main frame outside the insulation, instead of inside, as on the other cars.

"All of these cars are equipped with Liquidometers, by means of which the top and bottom temperatures inside the car may be read from the outside. They are also equipped for winter service with a heating system automatically controlled by thermostats which can be set to give desired temperatures within a few degrees.

"The fuel used in these heaters is propane gas, and the capacity of the fuel tanks is enough for the entire heating season. A gauge on the tanks permits the checking of the fuel supply.

"The heater and fuel tanks are supported outside the body of the car, accessible for serving and reducing fire hazard. Heat is circulated by means of an anti-freeze liquid passing through piping distributed over the floor of the car.

"Special trucks are applied, designed to stablize the motion of the cars and reduce the danger of damage to the lading due to rough track.

"By raising the hatch covers the cars may be ventilated through openings provided in the tanks.

"Special equipment applied to some of these cars includes sliding doors, an advantage at high loading platforms where the swinging doors must be opened before the car is spotted and cannot be closed until the car is moved. Also, metal running boards designed to prevent the accumulation of ice and snow and the consequent danger to train crews.

WEIGHT OF CARS

"The weight of these cars, equipped for summer and winter service, is approximately 1,500 lbs. lighter than the end bunker car equipped for the same service. The available loading space is increased by 400 cu. ft. (approximately 22%), and the carrying capacity is not limited by any disadvantage in refrigeration, as is the case in the end bunker car.

"The centers of gravity are low enough to permit of speeds considerably in excess of the maximum permitted by the operating department, and compare favorably with, for example, a modern box car loaded with oats.

TRANSIT REFRIGERATION A PROBLEM OF RAILWAY OPERATION

"Nearly all of the suggestions made for the improvement of refrigerator cars come from sources outside of the transportation industry," Mr. Walker concluded. "They are rarely acceptable, no matter how soundly based on theoretical fundamentals, because they show little or no comprehension of the many limiting factors imposed by the conditions of railway operation.

"It is, therefore, entirely correct to state that transit refrigeration is a distinct branch of refrigeration technique.

"Our experience on the Canadian Pacific proves that the medium by which refrigeration in transit is most economically and efficiently produced, is ice water. Eutectic ice is not at present an economical substitute for ice and salt, but will be important improvement over the mechanical mixtures presently employed.

"Solid carbon dioxide or dry ice can eventually displace the water ice at a minimum cost in changes of care design. Its employment will make possible positive control of protective temperatures inside the loading space.

"There are some problems connected with tne employment of steel in car construction. I am convinced that the steel car is an absolute necessity, having regard to the increased weight and speed of trains. The difficulties in the application of insulation are in a fair way of being solved. This is clearly indicated in the test results secured with our experimental cars."

How To Calculate Load Factors & Operating Costs on Refrigerating Systems for Trucks

(*Concluded from Page 14, Column 5*)

The required compressor capacity is determined by the length of time available for pull-down. During this time the condensing unit must refrigerate the hold-over cooling units and supply the insulation leakage and door opening load.

For trucks equipped with a condensing unit, nine hours is considered a minimum length of time for pull-down.

For trucks with valves for connection to the plant refrigeration system, a shorter period of time is expected and this is generally satisfied for the reason that the plant ammonia system is usually of relatively high capacity.

"The valve of hold-over unit capacity should be selected to take care of the maximum length of time that power is not available. For the partial hold-over system five hours is considered a reasonable length of time; for the full hold-over system 15 hours.

CALCULATING CAPACITY

"With the fixed ratio drive between the engine and compressor, the B.t.u. capacity of the condensing unit can be readily calculated in terms of B.t.u. per mile in high gear. During reduced gear operation, the B.t.u. per mile will be proportionally higher.

"As a typical example, the compressor runs 1000 revolutions per mile and produces a refrigerating effect of 260 B.t.u. per mile for the conditions of 100° F. ambient and —15° F. refrigerant.

"For the condition of 2770 B.t.u. per hour total heat load the compressor should operate 10.7 miles per hour. This is considered a reasonably low value for the type of service in which the No. 1 direct expansion type body is applicable.

"A greater mileage per hour will result in a reduction in back pressure to the cutout point, which will disengage the magnetic clutch.

"The conditions cited are for an ambient air temperature of 100° F. At lower ambient temperatures the condensing unit capacity is higher, the heat gain less and the percentage of compressor operation per hour is proportionally less.

MOTOR POWER INPUT

"The power input to the electric motor for normal operation of the condensing unit and for the condition of 100 F. ambient air temperature is approximately 1½ kw., and the average refrigerating effect is approximately 7,000 B.t.u. per hour. This represents approximately 4,700 B.t.u. per kw. hour.

"At three cents per kw. hr. a refrigerating effect of approximately 1,500 B.t.u. per cent of power cost is obtained.

"For the maximum load condition of 55,300 B.t.u. for 24 hr. the power cost would be 37 cents. The yearly average per day would be considerably less.

POWER COST

"By a similar problematical method the power cost in the form of gasoline consumption to operate the condensing unit on the road can be determined.

"By assuming a specific fuel consumption of .8 lb. per hp. hr., the additional fuel consumption for the condensing unit power would be approximately .22 gal. per hr., which, at 17 cents per gal., would be 3.7 cents per hr.

"This gives a refrigerating effect of 1,900 B.t.u. per cent of gasoline. For a delivery route requiring the maximum refrigerating effect of 41,500 B.t.u. per day, the power cost for gasoline would be approximately 22 cents.

"Under average conditions of less than 100° F. ambient air temperature and lighter service, such as fewer door openings, the power consumption and cost would be proportionally less."

Air Conditioning and Refrigeration Association Is Formed In Manhattan

Council Members Outline Their Views of What National Group Should Accomplish

Replies To Keller Letter Reflect Thinking of Industry Leaders

Editor's Note: Early this month John H. Keller, chairman of the temporary National Council of the National Air Conditioning Association, wrote members of the Council requesting an expression of their attitude toward certain national problems.

The following replies, from M. S. LeBair of Philadelphia and C. E. Hansen of Cleveland, are printed in full.

The Electrical Association of Philadelphia
Philadelphia, Pa.

Mr. Keller:

Your letter of May 2 certainly offers a big assignment, and I hesitate to express in detail the answers to the problems that you suggest.

I will try to cover some of them in brief:

1. *Aims and Ambitions*:

Promotion of the industry for the benefit of the users, sellers, installers, and manufacturers of air conditioning.

2. *Education and Publicity*:

This is something that I believe can be developed, consistent with the above aims. I don't have any concrete suggestions at the present time.

3. *Equipment Guarantees*:

Suggestions of standard guarantees as to both form and conditions can certainly be of tremendous assistance to the industry and can eliminate a great deal of confusion in the minds of the buyers. Such suggestions would unquestionably carry added weight emanating from a national association.

4. *Bidding Practice*:

Please excuse me now and forever more on this point. I have yet to hear of any organized plan in this regard that has not resulted in racketeering, and I believe there are certain groups that have been materially hurt by trying to control such procedure.

5. *Uniform National Codes*:

The national association can certainly cooperate with R.M.A. and A.C.M.A. and other such groups to assist in this picture, and the same thing applies to design standards.

6. *Relations with Consulting Engineers, Manufacturers, and Utilities*:

If this association is to be successful it must further friendly relations with all such groups in such manner as will assist various items mentioned above.

7. *Labor*:

A cooperative and friendly attitude that is at the same time firm should, I believe, be of assistance to air-conditioning dealers whether they are operating open or closed shops. In regard to labor practices in various parts of the country, an exchange of information should be of help.

I have no suggestions as to how the new organization should be set up at the minute. The group that I represent in Philadelphia feel that the membership should be limited to regularly operating distributors, dealers, or contractors who are exclusively handling the product of one recognized manufacturer in a given area. It is also their feeling that the financing should be by means of annual dues and not by means of assessments based on secured work.

I have given you very sketchily some opinions herein. Please do not consider them as final as I am completely open minded on all of these points and would be glad to discuss them with any other interested parties.

M. S. LeBair, Chairman,
Air Conditioning Division

Cleveland Report

The Smith & Oby Co.
Cleveland, Ohio

Mr. Keller:

I am heartily in accord with the idea of regional meetings.

Referring to the list of aims and objects of the proposed association, it is my opinion that relations with consulting engineers, relations with utilities, and with labor are purely local problems and should be handled locally.

I also believe much good can be done for the industry in the matter of education and publicity and proper design standards.

Equipment guarantees, business ethics, national codes, and relations with manufacturers are all subjects for study and recommendations regarding same, and would come within the scope of the organization.

Another subject for consideration would be improper national advertising. The word "air conditioning" carries a lot of romance with it and is used promiscuously in describing many products giving erroneous impressions to the public.

In regard to the membership in the organization, I would limit it to only those concerns or individuals actively engaged in the installation of all-year around air conditioning and any others might be accepted as an associate member with no vote in the association affairs. The reason for this suggestion is that problems may arise between the association and utilities or parts manufacturers, and pressure might be exerted to promote policies not in the best interests of the association.

My suggestion regarding financing an association would be by means of monthly dues. If financed on a basis of a percentage of cost of work installed, many questions and complications arise and the result would probably be a large membership and an association supported by a few "honest" members. Associate membership dues could be a smaller amount than full membership.

This exhausts the suggestions I have at hand at present, but I will forward any further thoughts as they occur.

I would appreciate being informed of proceedings as they are formulated.

C. E. Hansen

Walter Davis Appointed To Membership on National Council

* * *

BUFFALO — Walter P. Davis, executive secretary of the Air Conditioning Council of Western New York, has been appointed to the temporary National Council of the National Air Conditioning Association.

Mr. Davis is a representative of the local utility in Buffalo.

At the present time, the Buffalo Council has one of the largest memberships in the country, and is in excellent financial condition. Membership in the group includes not only air-conditioning men, but representatives of Buffalo newspapers and radio stations.

Walter P. Davis brings to the council a background of experience in merchandising, advertising, and promotion.

Copies of Bulletin Free To News Readers

Copies of the "Bulletin" of the National Air Conditioning Association, printed by Air Conditioning & Refrigeration News in the interests of the new group, will be sent without charge to readers of the News who request them. Three issues have been published to date and Bulletin No. 4 (June) will be issued soon.

The Davis Boys of Buffalo

Joseph Davis, president of the Air Conditioning Council of Western New York, rose from the ranks of labor to become an important York distributor. A onetime (1911-1917) steamfitter himself, Joe now employs about 60 craftsmen on large heating and air-conditioning projects.

Joining the U. S. Army in 1918, Mr. Davis was attached to the Motorcycle Dispatch Division of the A. E. F. where everything was fine, Joe says, until his speeding motorcycle ran afoul of an army transport truck and he was retired from active service by the resultant injuries.

By a combination of part-time work and attending classes, Joe graduated from Carnegie Tech as an engineer in 1928. By 1930 he had been certified as a "Professional Engineer" in the state of New York.

A conscientious member of the ASH&VE, Joe was awarded a watch for obtaining the most members for that organization in 1930.

Not to be confused with Joe is Walter P. Davis, executive secretary of the Air Conditioning Council of Western New York, and most recent appointment to the National Air Conditioning Council.

Walter Davis has applied the "sales technique" learned during many years of appliance and specialty merchandising to the promotion of air conditioning in the Buffalo area.

Indianapolis Considers

Air Conditioning Council of
Indianapolis, Indiana
Indianapolis, Ind.

Sir:

At the last meeting of the Air Conditioning Council of Indianapolis the matter of appointing a delegate to the Temporary National Air Conditioning Association was brought up for discussion once more. After consideration and remarks by several members the matter was tabled for 30 days.

Apparently a number of the members have not definitely decided that this new organization will fulfill any further outstanding services than those now furnished by existing associations. One suggestion from the floor was that our present council group be used as a nucleus for a local chapter for the American Society of Heating and Ventilating Engineers.

We shall be glad to keep you advised of any further action and trends of our council in this matter.

E. S. Hildreth, Secretary-Treasurer

Eleven Distributors Are Members of New Group

NEW YORK CITY—Most recent local air-conditioning group to be formed is the Air Conditioning and Refrigeration Association of New York. Announcement of the new organization was made here recently by Arthur F. Callahan, managing director.

Kenneth Hamilton, of Carbondale New York Co., Inc., is chairman of the association.

Mr. Callahan is also director of the Refrigerator Association of New York, comprised of local distributors of domestic refrigerators. Headquarters for the new group will be maintained at Mr. Callahan's offices.

Charter members of the new association are: Airtemp New York Co., Inc.; Armo Cooling & Ventilating Co., Inc.; Carbondale New York Co., Inc.; Frigidaire division, General Motors Sales Corp. (New York branch); Alfred L. Hart, Inc.; Kelvinator division, Nash-Kelvinator Corp. (New York branch); Quinn Engineering Co.; Schwerin Air Conditioning Corp.; Typhoon Air-Conditioning Co., Inc.; York Ice Machinery Corp. (New York branch); Blagden Bros., Inc.

Davis Accepts Post On Council

Air Conditioning Council of
Western New York
Buffalo, N. Y.

Sir:

With reference to a representative from our Council to serve on the National Council of the proposed association, wish to say that the "Boys" have given me that honor. Therefore, you may subscribe my name on the records and when it is necessary, I will attend meetings where, if and as held.

Walter P. Davis,
Executive Secretary

Requests Bulletin

Pines-Natkin Co.
Westinghouse Air Conditioning
209 Browder St., Dallas, Tex.

Sir:

Will you be kind enough to place the following names on your list to receive the bulletin of the proposed National Air Conditioning Association:

O. G. Carlson, Merchandise Mgr., Texas Electric Service Co., Fort Worth, Tex.

Paul E. Cassidy, Texas Power & Light Co., Corsicana, Tex.

F. S. Barton, Texas Power & Light Co., Athens, Tex.

J. W. Baugher

Air Conditioning Association of Michigan Approves Detroit Refrigeration Code

DETROIT—Complete approval of the new Detroit Refrigeration Code, with a tentative reservation regarding the provisions covering the use of silver solder or mechanical joints, was given at a meeting of the Air Conditioning Association of Michigan on May 22.

Discussion at the meeting centered around the difficulties that have been encountered in using silver solder which melts at 1,000° temperature. Some distributors maintained that this type of solder was very difficult to handle, while others stated that their refrigerant fitters had been able to use it without difficulty.

Use of a "mechanical joint" was discussed at length, with interest centering around a new ferrule joint which is now under test by the Detroit Building Department. It is understood that this joint will be built by a Detroit concern and made available in a limited range of sizes for air-conditioning work.

The Detroit Refrigeration Code, Section 12.28, requires that "soldered joints in pipe or tubing erected on the premises shall remain mechanically intact when subjected to a pull apart test equal to a pressure of not less than 500 lbs. per square inch gauge pressure with a temperature of not less than 800° F., except that this requirement shall not apply to soldered joints in pipe or tubing of ½-inch nominal size or smaller when used in systems containing not more than 20 lbs. of refrigerant."

The Code permits the use of either soft or silver solder in these joints. On the suggestion of inspectors for the Department of Safety Engineering, some distributors have attempted to insert screws in soft soldered joints, with the result that bad leaks were encountered.

Others stated that it was impossible to repair a silver solder joint, and that, when leaks occurred in the joint, it was necessary to repair the silver soldered joint with soft solder.

Members of the Air Conditioning Association of Michigan agreed to keep careful costs of all silver solder and mechanical joint work through the present season, and, if costs for labor and materials proved to be exorbitant, to submit actual schedules of costs to the Department of Safety Engineering, with the recommendation that the clause be modified. No recommendations for changes in the Code will be made unless distributors find that costs resulting from the provision become excessive.

A preference was stated favoring the use of steel pipe with welded joints in "Freon" lines of 2 inches and over. This would leave only the sizes from ⅞ inch to 1½ inches to be joined with silver solder or mechanical joints.

Air-Conditioned Pullmans To House Shriners

BALTIMORE—Three hundred and one air-conditioned Pullman cars will become temporary "homes" for 6,000 Shriners during their national convention here June 27, 28, and 29.

Air Conditioning

Experience With Government Bldgs. Points To Air Distribution as the Major Problem

(Concluded from Page 1, Column 2)

operating experience is in air distribution and control. He was quite critical of the side wall grille, at least in the Washington installations, and showed pictures of how the employes had in some cases boarded up the grilles, or made efforts to cut down the velocity or change the direction of the airflow (one ingenious fellow had punched a paper bag full of holes and tied it over the outlet grille).

Criticisms of operating system details included too much loss of refrigerant, too much noise, failure of metals to stand up, and failure of controls to provide conditions to satisfy all of the occupants of an air-conditioned area.

On the brighter side of the picture Mr. Peters declared that air conditioning had improved employe efficiency, and had greatly reduced the number of "leave days" that used to be taken by employes during the unbearably hot Washington summers, in the days before air conditioning.

NEED LEAK DETECTOR

"The largest quantity of our tonnage is in 'Freon' equipment," Mr. Peters said. " 'Freon' is quite expensive, and one of our principal problems with this type of equipment is to detect leaks in time to prevent the loss of substantial quantities of refrigerant.

"Some improved method of detecting leaks over that now existing by the use of halide torches would be a decided benefit to the operating man and would increase the popularity of 'Freon' equipment. Of course, where leaks develop within the condenser or cooler, it is practically impossible to detect them until large quantities of refrigerant have escaped, and the replacing of this 'Freon' is quite an expensive item.

METAL FAILURES

"We have had considerable trouble with condensers and coolers where ferrous tubes have been used. We have also had trouble where condensers and coolers contain a large number of very long, small tubes.

"The tubes on equipment of this type have a tendency to crack off at the tube sheet, allowing the refrigerant to escape. In this type of equipment, the manufacturers can do much to help the operating man by seeing that a better type of condenser and cooler is provided and that the piping is installed in a manner that will result in minimum trouble through leaks.

"In the centrifugal type of equipment, the lower suction and discharge pressures apparently result in less trouble through the loss of refrigerant through leakage. Of course, in the water vapor machine there is no expense of refrigerant.

NOISE A PROBLEM

"However, all types of centrifugal machines operate at enormous speed, which results in certain high-pitched noise which, in some places, is very objectionable.

"We have not had sufficient experience with operating all of the various types of equipment to arrive at any conclusion which would indicate that one particular type will be less expensive to operate over a period of years than another type.

"Our condenser water comes from three general sources: the city water supply, cooling towers, and from the Potomac River. In designing the systems for the various buildings, it was found uneconomical to attempt to use filtered city water for the large installations, so that this type of water is used only in some of the smaller units which we operate.

CONDENSER WATER SOURCES

"Cooling towers have been provided for four of our large installations, while the other four use river water. The use of cooling towers has proved quite satisfactory, but their operation involves a considerable expense. These towers are of the forced draft spray chamber type, which requires the operation of fans and, of course, the cost of electricity for operating fans and pumps is considerable.

"While the water is chemically treated to prevent marine growths and corrosion, it is still necessary to be continually on the alert to prevent serious deterioration through corrosion.

"The use of river water in four of the large buildings has presented many difficult and unusual problems, some of which still require solving. This water is never really clean and is passed through strainers to take out solid matter and debris. We have been seriously hampered in operation by a marine growth called Pectinatella, which apparently grows in the tunnel section, becomes dislodged after reaching considerable size, and passes through the line to clog the strainers and occasionally becomes so bad as to threaten to shut down the systems at the time when the demand is greatest.

"We expect, during the coming year, to correct this condition through the use of chlorine to kill this growth and we are also planning to install an automatic screen to remove the smaller debris and such of the marine growth as we are not successful in killing prior to its reaching a substantial size where it proves to be troublesome.

AIR MOVEMENT VITAL

"I believe that the refrigeration man must help solve the general problems in air conditioning, if he expects to create an additional market for refrigeration equipment," Mr. Peters stated. "Our experience has indicated that air conditioning is accepted or condemned primarily through the success or failure of two factors. These two factors are air movement and control.

"Many methods of introducing air into the space to be air conditioned have been developed. We have, in our buildings, all varieties. Our experience would indicate that each type of air inlet has its place and when used in the wrong place is a serious hazard to the success of the air-conditioning industry, in that it creates drafts which are a very disturbing element to some persons and which cause these persons to condemn air conditioning.

ON WINDOW UNITS

"We have in our buildings many of the so-called window units, but I might add here that if the window unit is not designed to heat and distribute the air uniformly across the unit during the winter season, there results an uneven circulation which produces cold drafts in certain portions of the room.

"The well-designed window unit has many advantages in that the air is introduced adjacent to the windows and in a vertical direction, thus resulting in air movement which is quite effective, but is not directed on the room occupants unless they are located too close to the units.

"The various ceiling type outlets, such as the ceiling plaque, the pan outlet, and similar devices, are usually quite successful, but are quite often objectionable architecturally and quite often involve the lowering of ceilings to permit duct installations. This type of inlet, to be successful, must be connected to a system where the air is introduced at satisfactory temperatures and velocities to secure proper distribution without draft.

THE SIDE WALL GRILLE

"The side wall grille, which is perhaps the simplest to install in existing buildings, presents many problems. The low ceilings or the necessity to use low ducts quite often results in drafts or in the spilling of cold air, which proves very objectionable.

"When side wall grilles are used, it is essential that each particular space be studied and that the air velocity and all the details be worked out in conjunction with the type of grille for each particular room or location, so that drafts will not result.

"Improperly designed or installed side wall grilles, together with improperly designed distribution systems supplying air to these grilles, have perhaps resulted in more criticism against air conditioning than any other cause.

CONTROL IMPORTANT

"In general, it is the introduction of air and the movement of air in occupied space which forms the basis of most of the complaints that we receive against the air-conditioning systems. Predetermined temperatures can be maintained, humidities can be controlled, odors and staleness can be done away with, and even noise of air entering and fan noise can be reduced enormously, but in order to move air into a space and out of that space again, it is vital that some movement of air exist in the room.

"Our experience indicates that the minimum of complaints from occupants who are sensitive to drafts come from rooms which are equipped with properly designed and installed ceiling outlets, while the maximum number of complaints come from localities provided with side wall grilles. Even though many people state that they do not mind a small draft, it still has been found that many building occupants have been made very uncomfortable and are irritated by slight movements of air.

"The other feature which is extremely important is control, and by control I mean control of temperature, humidity, quantity of air, amount of fresh air, et cetera.

DESCRIBES 'IDEAL' SYSTEM

"The ideal system would perhaps be one in which each room would be treated as a separate unit, in which the occupant might have the temperature and humidity which he or she desires, and at the same time, sufficient air quantity to satisfy and also sufficient air movement to remove tobacco smoke, odors, and any other objectionable conditions from the various rooms.

"To install a system in a large building where each room could be separately controlled is obviously an ideal which is too expensive for practical application at this particular time.

"However, if we are to succeed in satisfying the maximum number of people and thus sell our idea of air conditioning to everyone, the research experts must strive to accomplish individual control or nearly individual control at a reasonable cost."

Appreciating the added efficiency which results to their personnel, said Mr. Peters, the various government departments in Washington housed in buildings which are not air conditioned, have urged the National Park Service to secure funds to air condition those buildings.

As a result, a program was worked out for air conditioning the eight principal government buildings in Washington which are not now air conditioned. To air condition these buildings will cost approximately $12,000,000, and to accomplish this, a five-year program calling for an expenditure of $2,500,000 each year was presented to the Bureau of the Budget.

WHAT CONGRESS SAID

This program was approved and submitted to the Congress for inclusion of an item of $2,500,000 in the Interior Department appropriation bill for the next fiscal year. After hearings were held on this item, the Appropriations Committee of the House reported on this item as follows:

"Air Conditioning of Buildings in the District of Columbia.—In disallowing the estimate of $2,500,000 for the air conditioning of five Federal buildings in the District of Columbia, the committee was influenced by personal observations and experiences in connection with the air conditioning of buildings which were constructed many years before the advent of air conditioning and which were not originally designed for it. The Federal buildings in which air conditioning is apparently satisfactory are those in which installation occurred at the time of construction, with the possible exception of the Old Interior Department building, which was air conditioned at a cost of approximately $1,200,000. The committee is of the opinion that the expense of installation is so great and the benefits to be secured, if any, so doubtful, that it would be economically unsound to proceed at this time with the large expenditure proposed in the budget estimates."

"This should show clearly," said Mr. Peters, "that certain of the air conditioning which has been installed is not satisfactory.

"If these installations are to be made and the air-conditioning industry grow, it is necessary that the present unsatisfactory elements be eliminated. The principal present complaints come through improper air distribution and lack of proper control. The refrigerating engineer's job must accordingly reach out beyond the manufacture of refrigerating equipment, which is perhaps the one element in air conditioning which can be most easily controlled, to the wider field of air conditioning as a whole.

"The amount of money involved in the apparatus governing air movement and control is perhaps not sufficient to justify the extensive research which is essential and necessary, and which, I believe, must be fostered by the other groups interested in air conditioning, including the refrigeration industry."

Schwanhausser Is Elected Worthington Vice President

HARRISON, N. J. — Edwin J. Schwanhausser, since 1939 works manager of the Worthington Pump & Machinery Corp. plant at Buffalo, has been elected a vice president of the company. He will continue work at Buffalo on the development and manufacture of Diesel and gas engines, and air, gas, and refrigeration compressors.

D. Rait Richardson Dies; Headed Conditioning Firm

NEW YORK CITY—D. Rait Richardson, 64, former president of Richardson & Boynton Co., New York manufacturer of air-conditioning and heating equipment, died May 8 at Palm Beach, Fla.

Service Methods

Automatic Purger Can Be Installed as Combination Expansion Valve & Purger

THREE RIVERS, Mich.—Designed to operate as a refrigerant gas purger or as a combination expansion valve and purger is a unit introduced by Armstrong Machine Works.

The unit, which can be used on systems employing any common refrigerant except CO_2, works automatically without requiring operating attention after it has been placed in service, and is claimed to remove air and incondensible gases from the system, allowing a minimum of refrigerant gas to escape.

The unit consists of an inverted bucket and valve mechanism in the lower half, and a ball float and needle valve in the upper jacketed dome. It is connected to the high side receiver so it can take gas from the top of the receiver, and just enough liquid from the bottom of the receiver to keep the cooling jacket filled.

When used as a combination expansion valve and purger, the unit is connected directly to the bottom of the condenser. It takes the liquid refrigerant as fast as it forms and discharges it into the low side evaporator. This flow brings any air present into the purger, where it is collected and discharged from the upper chamber.

After the refrigeration system is started up and has run long enough for a quantity of liquid refrigerant to collect in the receiver, the purger is ready to be started. Starting with valves A, B, C, and D all closed, the following is the procedure:

1. Open expansion type valve A until liquid refrigerant is at least half way up in the gauge glass. Then close valve A and open wide valve B. (See Fig. 1.)

2. Slowly open valve C leading to the compressor. This will lower the pressure on the liquid refrigerant that fills the purger body and the jacket that surrounds the top of the purger.

This lowered pressure will cause the liquid refrigerant to boil. Also, the lower pressure will cause gas from valve B to flow to the purger and collect in the inverted bucket. The inverted bucket then floats and closes the valve that allows liquid refrigerant to enter the jacketed space.

From this point on high pressure will be maintained inside the purger body, but suction pressure will prevail in the jacket surrounding the top of the purger. Frost will form on the top casting of the purger due to the boiling of the liquid refrigerant at low pressure. At the same time, the liquid inside the inner dome of the purger will be chilled to within a few degrees of suction temperature.

Purger Installation

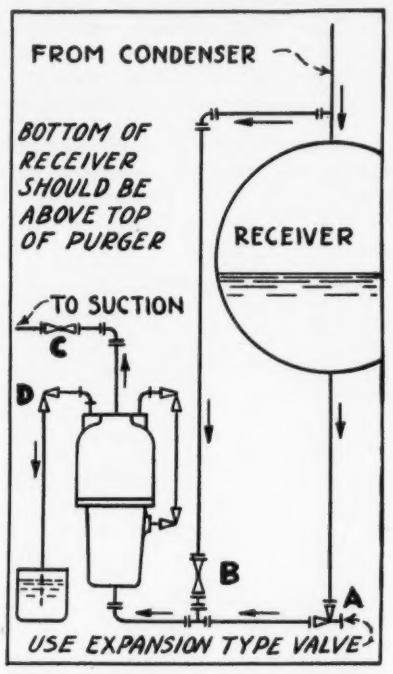

Fig. 1—How the new purger is hooked into a refrigeration system.

3. As soon as the top part of the purger is well frosted, valve D should be opened to allow the upper float valve to discharge air into the water jar. At the same time valve A should be cracked to let in just enough liquid to maintain the frost line just above the top of the purger casting.

OPERATING CYCLE

Incoming Gas-Air Mixture—As the mixture of refrigerant gas and air flows through Valve B and on into the purger, it enters the inverted bucket and then passes upward through the small vent in the top of the inverted bucket. A baffle directs this mixture of gases against the cold wall of the top casting as it bubbles up through chilled refrigerant. Since there is no reduction in pressure, the lowered temperature results in the immediate condensation of the refrigerant gas. Air, of course, does not condense, but collects in the inner dome of the purger.

Air Discharge—As the liquid level drops due to accumulation of air in the inner dome of the purger, the ball float sinks slightly and cracks the needle valve thereby permitting air to bubble into the water jar.

At first the air will escape very rapidly due to the high concentration of air in the ammonia gas that passes through the vent in the top of the inverted bucket. As the purger continues to operate, however, the air concentration is reduced so that fewer and fewer bubbles of air appear in the water jar. When all the air has been eliminated from the system, the needle valve will remain closed tight and no air whatever will pass through valve D.

Air that does pass through valve D will be saturated with refrigerant gas at the temperature corresponding to the suction pressure. However, if there are only 6 cu. ft. of air in the refrigeration system, the amount of refrigerant gas that escapes with the air will be just enough to saturate the 6 cu. ft. of air at the suction temperature.

No matter how long it takes the purger to get rid of this air, the refrigerant gas loss will always be directly proportional to the amount of air removed rather than to the amount of gas purged.

Replenishing Liquid in Jacket—As mentioned previously, valve A is cracked just enough to maintain the frost line above the top of the purger casting. The small amount of liquid that passes through valve A will be carried along into the purger by the flow of gas from valve B. This liquid fills the inverted bucket, causing the bucket to lose its buoyancy and sink, thus opening the liquid valve and allowing more liquid to enter into the jacketed space surrounding the upper dome.

As soon as the pipe leading to the purger is cleared of liquid, gas again flows in and the bucket again floats and shuts the valve.

At first it may seem strange that the liquid level in the purger body does not drop when the liquid valve opens. Any drop in this liquid level would lower the pressure on the air above the liquid. This lower pressure would immediately cause gas or liquid to flow to the purger through valves A and B, and they can flow in much faster than liquid can flow out through the purger liquid valve.

Therefore, if more liquid enters the purger, the liquid level will not drop. If gas enters the purger, the inverted bucket floats and shuts the valve.

This may be a little difficult to visualize, but in actual operation, the liquid level in the purger remains constant, except when air is passing through the purger unit, which causes slight fluctuations to occur.

Used As Combination

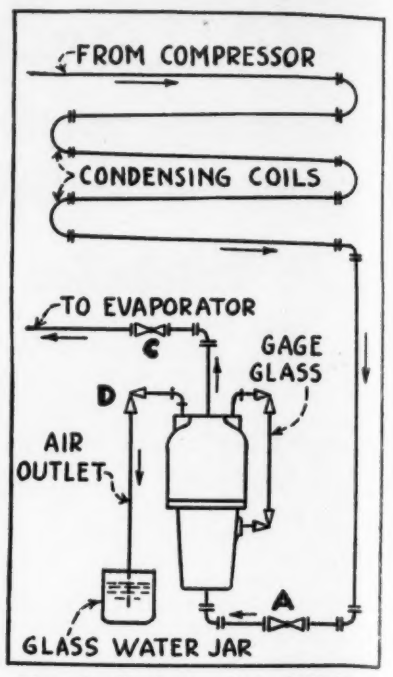

Fig. 2—Method of installation when device is to serve as combination purger and expansion valve.

COMBINATION SERVICE

Fig. 2 shows how the purger can be used for combination expansion valve and purger service. This type of application is advantageous when all of the liquid refrigerant is carried on the low pressure or evaporator side. Any air that is in the system, or may enter the system due to low suction pressure, or gets in when charging the system with additional refrigerant, will be vented from the purger automatically without any attention on the part of the operating engineer.

To Operate—Assume all valves closed. When enough refrigerant has accumulated to prime trap, open valve A. When liquid shows well up in the gauge glass, open valve C. As soon as the purger top is well frosted, open valve D. When all air is purged from system, valve D can be closed, but should be opened slowly whenever the liquid level drops below the halfway mark in the gauge glass.

Small Expansion Valve Designed By Mayson

DETROIT—Extremely small and compact, and adaptable to practically any type of refrigeration system, is the new Model L adjustable thermostatic expansion valve being manufactured by Mayson Mfg. Co. here.

Designed and developed by E. M. May, founder and president of the company, the valve may be used in place of a capillary tube, it is said. Capacity is carefully graduated for fractional horsepower installations and adjustable for various superheat requirements on different evaporators.

Although adjustable from 5 to 30° superheat, the valves are factory set at 10°, which is suitable for the majority of installations, the company claims. Available in capacities of ⅛, ¼, and ⅓ hp., the valve may be used with either sulphur dioxide, methyl chloride, or "Freon."

Liquid charged and bellows operated, the Mayson valve has a Stellite-tipped valve needle, stainless steel interior working parts, forged brass body and cap, and a removable filter. Exposed joints are silver soldered.

About 300 of these valves are being turned out daily, Mr. May reports, but the company is far behind on orders and production would be nearer 500 units per day if the necessary materials could be secured without delay.

Sales so far, he says, have been about 50% for installation on original equipment and 50% for replacement work.

New Visor Introduced By Jackson Co.

DETROIT — A stiffening metal binding around the edge of the flexible visor shield, a spark deflector which protects the opening between visor and forehead, and a fiber head protector lined with fireproof duck for comfort—these are the distinguishing features of Model C-1, newest member of the 15-model line of eyeshields manufactured by Jackson Electrode Holder Co. here.

Visors are available in a variety of shades and lengths, will not ignite spontaneously, and are non-fogging, it is said. They are claimed to provide full vison with maximum ventilation, and are recommended for use on soldering, brazing, and welding operations, as well as on many types of grinding and chipping jobs. Visors are also furnished in Monel metal mesh.

Sterling Products Announces Two New Sanders

DETROIT—A portable version of the Sterling "Speed-Bloc" sander and a sander designed for fixed mounting on wall or ceiling are now being offered by Sterling Products Co.

The portable unit consists of a tray mounted on castors and equipped with uprights and fittings which make it possible for owners of Sterling sanders to mount their machines as portable units, thus making them usable in any part of the shop or plant.

Attracting One Additional Passenger Per Trip Will More Than Pay Cost Of Cooling a Bus, A.S.R.E. Told

HERSHEY, Pa.—"Attracting one additional passenger per trip more than pays the cost of air-conditioning equipment for the average motor bus," A. J. Mallinckrodt and Lars Hanson of Carrier Corp. said in a paper presented before the American Society of Refrigerating Engineers here last week.

A study of bus passenger traffic indicated that while volume remained almost constant in the northern states during summer months, the southern routes lost a considerable portion of their revenue, presumably to air-conditioned railway trains. Even though many bus lines are owned by railroads, it has been found to be desirable to prevent seasonal shifts from one type of transportation to another, as it is necessary to provide both types of equipment to carry the maximum load for any season.

WEIGHT MAIN PROBLEM

One of the first considerations in the design of bus air-conditioning equipment is weight. Most buses weigh approximately 20,000 lb. and carry a 6,000 lb. pay load. As certain states limit the total overall load of buses permitted on highways to 26,000 lbs., it follows that any weight added for air-conditioning equipment must be deducted from the pay load of the bus with a resulting drop in gross revenue.

Another factor to be considered is distribution of weight, as certain states limit the amount of weight to be carried per wheel or per axle. Added equipment may also affect the tire size and the amount of wear to be expected from a given tire. If the weight is not evenly distributed the road stability of the vehicle is impaired and it becomes imposible to maintain the schedules necessary to competitive means of travel.

TEMPERATURE DIFFERENTIAL

"The temperature differential to be maintained for greatest comfort is somewhat different than it would be for the usual stationary air-conditioning system," the paper states, due to the fact that a bus may leave Los Angeles with an outside temperature of 75° F. and in a few hours be in Needles, California, with a temperature of possibly 120°.

INSULATION IMPORTANT

Reduction of the required cooling load by means of improved body construction is essential. With the speeds employed on western highways the body must be made quite tight to prevent air leakage. Permanently closed windows are desirable, both from the effect on the cooling load and for cleanliness.

Body insulation to the extent of a 1½-inch blanket is usually employed. To minimize sun effect through walls and roof it is desirable that at least the roof be painted to reflect sunlight, even though the remainer of the paint scheme is based on other considerations. Solar heat load must be based on considerations which include the use of large windows, as many people ride buses for sight seeing purposes and would not want shades to be drawn.

INSTALLED IN 1938

Following preliminary experimental work in 1936, air-conditioning equipment was built and installed in a fleet of buses and put in operation during the summer of 1938. The capacity of the unit was 3½ tons which was sufficient to maintain inside conditions of 80° dry bulb and 68° wet bulb, when outside conditions were 100° dry bulb and 78° wet bulb.

The equipment consisted of a 4-cylinder gasoline engine, connected by V-belts to a compressor, an air cooled condenser, and a receiver mounted as one condensing unit. The condenser fans were of the centrifugal type, mounted on a shaft direct connected to the engine. The cooling system of the air-conditioning engine was connected to the main engine radiator which had been increased in size to take this additional load.

LOCATION OF COILS

Evaporator coils and fans were located under the roof above the driver's seat, the housing being built as a part of the bus body to conserve space. Fans having a capacity of 1,100 cfm. were driven by a ¼-hp. motor receiving its energy from the bus lighting system. Outside air circulated totaled 360 cfm.

Conditioned air was admitted a single outlet discharging horizontally under the ceiling toward the rear. Control equipment consisted of a thermostat connected to a liquid line solenoid valve. When the temperature fell to the desired point, the thermostat would close the liquid line solenoid valve, permitting the compressor to pump down the system. When the suction pressure was reduced to a predetermined point, a pressurestat opened a bypass solenoid valve around the compressor, permitting the compressor to idle. The engine was permitted to operate at constant speed throughout the cycle. A high pressure cutout was provided to guard against excessive head pressures.

Total weight of the equipment was approximately 1,250 lbs., not including insulation of the bus body.

SERVICE PROBLEMS

The paper reported that when the equipment was first put in operation, maintenance problems were exaggerated due to the fact that personnel in charge of service was not thoroughly familiar with air-conditioning equipment, and it was decided that it would not be practical to maintain a separate force for this part of the service work.

Later, the work was segregated and some of the men came to specialize on air-conditioning equipment. As these men took charge and the men under them became more familiar with the apparatus, road failures of the air-conditioning equipment were reduced to a point that was highly acceptable.

"The problem of providing proper facilities for servicing (bus) air-conditioning equipment will probably remain one of the major problems in connection with this work for some time to come, the paper continued." Unfortunately, we have not come to the point where the principles of operation of an air-conditioning system are as generally understood as are those of the operation of automotive equipment.

Elliff Joins Stewart-Warner As Hiter's Assistant

CHICAGO—Joseph C. Elliff, who recently resigned as western manager of The Saturday Evening Post, has joined Stewart-Warner as assistant to Frank A. Hiter, vice president and general sales manager.

PERSONALITIES

By George F. Taubeneck

Gandy Dancer

Braintrusters Glenn Muffly, J. F. Stone, Phil Redeker, and Mrs. Crosby Field lived up to their advance billing at the A.S.R.E. "Information, Please" game Sunday night in Hershey.

Questions were submitted on forms by members of the audience. These questions were approved or disapproved by a committee of judges, and Detroit Lubricator's Dick Townsend read them off, in order. If none of the Braintrusters could answer, the person who submitted the question was solemnly presented with a quarter.

The B. N. P. Co.'s Mr. Redeker, as expected, was a wow, especially in his command of history. Mr. Stone shone in knowledge of things naval, and Mrs. Field was the expert in the field of literature.

Mr. Muffly, however, was a distinct surprise to some of the good folk who had thought of him chiefly as an inventor. Mr. Muffly turned out to be an authority on the folklore of the American hobo.

Do you know, for example, what a "bindlestiff" is, or a "gandy dancer?" Mr. Muffly did. His definitions:

"Bindlestiff"—tramp who carries his bundle on a stick over his shoulder.

"Gandy dancer"—bum who likes to walk the rails on a railroad track.

For an explanation of this amazing section of Mr. Muffly's lexicon, see the "Personalities" column in the Jan. 25, 1939 issue of the NEWS.

* * *

Vandalia

Yours truly submitted a question-and-answer which was rejected by the judges. It ran as follows:

Q. What was the first state capital of Illinois?

A. Vandalia. A mite huffy about the injustice of it all, we asked Judge Chester Lichtenberg why it had been rejected.

"Because I don't believe it," he answered, vigorously.

Vandalia, Illinois, papers please copy.

* * *

Hole In Twenty

Thomas Coyle of Du Pont's R. & H. Chemicals division grabbed us almost before we had our bags unpacked Sunday and advised:

"If you want something to write about, go out and try to play that first hole. It's the dum-dingest, dad-flubbed brainstorm you'll ever see. And if you can describe it, you're good."

Further testimony on the part of Tommy Thompson ("Freon") Bill Higham (Universal Cooler) Ken Newcum (Superior Valve) and others convinced us that this must be a first hole to end all first holes.

It seems that if your first drive will travel on a line for 320 yards, splitting a cat's hair nine feet from the ground, then dipsy-do over a hummock and curve right at a 40° angle in order to drop dead on a plot consisting of three huddled four-leaf clovers, you can miss all the traps and have a clear second shot to the pin, which then will be only a couple of counties and a range of No. 2 foothills away.

* * *

Eustis Wins!

At tennis, Braintruster Stone disposed of both "Doc" Hainsworth (Electrolux), last year's champion, and Emerson Brandt, the amiable Ice Man. But don't let anyone tell you that Hainsworth and Brandt can't play tennis. Friends, they are good!

And in the annual traditional set-to between past-sixty A. H. Eustis (Ansul Chemical) and 29-year-old Phil Redeker, Mr. Eustis was the victor, thus gaining his second leg on the cup which someday someone will donate for this annual contest.

* * *

Peak To Crag

Speaking of Dr. Hainsworth, did you know that he is a mountain climber? Fact. It's his favorite recreation. On vacations he clambers all over the Rockies, and in Switzerland three years ago he mastered the famed Matterhorn.

The lovely Mrs. Hainsworth relates that on this latter occasion, her amazing husband had been on his way up the mighty peak for several hours, when she was called to the inn courtyard by an attendant, who had spotted Hainsworth and his companion through a big telescope.

Just when she had drawn a bead on the two tiny figures as they fought their way up an apparently sheer cliff, a tremendous cloud enveloped them.

That, said the attendant, would be a snowstorm. They'd have to "freeze" in their tracks for several hours, probably.

So Mrs. Hainsworth went out for a walk to steady her nerves. Soon she found herself in the midst of a cemetery. The inscriptions on the headstones, she found, all read something like this:

JOHN DOE. 1890-1930. Perished in snowstorm while attempting to climb the Matterhorn.

Two days later, after having scaled the peak and looked around at the sights, Mr. Hainsworth came back—15 pounds lighter despite all the extra whiskers. And that was the time, we presume, when youngish Mrs. Hainsworth acquired her stunning silver hair.

* * *

Time Marches On

After last spring's A.S.R.E. convention, we had several things to say (in awed tones) about child-prodigy Mary Field, daughter of the Society's president, Crosby Field.

Mary was the little girl in rompers who had added 10 years to the life of a stationer's clerk by purchasing a sliderule, and demonstrating to the incredulous clerk that "she knew all about logarithms."

Well, Miss Mary, we'll have you know, attended the Ball Monday night in an evening dress with a bouffant, ground-sweeping skirt which had Mainbocher written all over it!

Son, fetch yore pore old grandpap his cane and a pillow. That rheumatiz is shore mizzable tonight.

Industrial Market Study To Be Issued By U.S.

WASHINGTON, D. C.—An industrial market survey containing complete figures on industrial production, employment, value of products, cost of material for fuel and power, will be issued by the Department of Commerce soon, Harry L. Hopkins, Secretary of Commerce, has announced.

Called the Industrial Market Data Handbook, the 1,000-page study is said to be the first marketing survey of American industry ever to be presented in this form. Data will be supplied on a county, city, and national basis.

Location of 169,111 manufacturing plants and the industries in which they are operating will be presented in the handbook. One feature of the book will be a county location table for each of the 23,000 mines in the United States.

As a guide for marketing men in determining the best available channels of distribution for their products, there will be included six tables on the methods of distribution of industrial goods for industry as a whole, and for certain selected major industries in particular.

Information contained in the handbook, it is said, can be used for the establishment or reappraisal of sales territories, setting up of sales and production quotas, making market analyses, and planning sales and advertising campaigns.

Bureau of Foreign & Domestic Commerce, Bureau of the Census, and Bureau of Mines are cooperating in preparing the handbook.

THE BUYER'S GUIDE

Wanted: An Open-Minded Organization With the Ability To Evaluate New Projects

Nathaniel B. Wales, One of the Founders of Kelvinator, Tells About Some of His Experiences as a Pioneer

IMPORTED SULPHUR DIOXIDE FROM GERMANY AND BUILT HIS OWN THERMOSTATS. BANKERS COULDN'T SEE ANY FUTURE FOR ELECTRIC REFRIGERATORS

A letter from R. J. Broderick, Refrigeration & Air Conditioning Institute, Chicago, to F. M. Cockrell, publisher of the NEWS:

* * *

Your very interesting article in the Oct. 26, 1938 issue of AIR CONDITIONING & REFRIGERATION NEWS, concerning the work of Arnold H. Goss in the early days of the refrigeration industry, reminded Mr. R. D. Smith that last January he received a letter from Mr. Nathaniel B. Wales, giving information which he believes you would consider as being of value and having historical significance. Attached is a photostatic copy of Mr. Wales' letter and perhaps he would be agreeable to rewriting these same facts in a letter to you, or would authorize the use of this letter in the event that you found anything in it of importance for publication.

* * *

Built First Refrigerating Unit In 1910

Following is the letter dated Jan. 7, 1938, from Nathaniel B. Wales, 400 Madison Ave., New York City, to Mr. Ray D. Smith, president, Refrigeration & Air Conditioning Institute, Chicago.

* * *

In reference to your letter of Jan. 5, I should indeed appreciate your "Fourth Annual Report to the Industry" and look forward to receiving it.

When I look back over the years from the time that I built my first domestic refrigerating unit, I well remember my work in the Colton Pharmaceutical Plant on the corner of Chene St. and Jefferson Ave. in Detroit in the fall of 1910, the third unit after this one, with improvements being made from time to time on the original machine, then becoming the demonstrator which resulted in the formation of the Kelvinator Corp.

The original incorporators were my two associates whom I was able to interest in the proposition, viz., Mr. A. H. Goss and Mr. E. J. Copeland. Mr. Copeland was at that time Purchasing Agent of the Buick Motor Car Co. I was always amazed at the tremendous development in the industry in this interim of years.

Banker Calls It 'Machine Shop In the Kitchen'

I remember talking with one of the Vice Presidents of the First National Bank in Detroit at that time, soliciting his financial support and his remark to me, "Well, Mr. Wales, I can see no future for your refrigeration machine beyond a few millionaire homes, for how can the public afford to put in a whole machine shop into a kitchen to make a few cubes of ice."

* * *

In reply to Mr. Cockrell's request for further information, Mr. Wales wrote as follows:

* * *

Put Lord Kelvin's Theory Into Practice

In reply to your interesting letter of Dec. 2, I will try to give you a brief outline of conditions and facts as they existed in Detroit in 1910 when I built my first domestic refrigerating machine.

I am a Bostonian by birth, having graduated from Harvard University in 1905, specializing there in physics. In 1907, having been intensely interested in Lord Kelvin's theoretical treatise concerning an "inversion of the refrigerative cycle," I reduced this cycle to practice, building what I believe was the first heating machine operating on a cycle which was an inversion of the refrigerating machine. This machine was built in the plant of the B. F. Sturtevant Co. at Readville, Mass. I obtained temperature effects in accordance with thermodynamic laws which underlaid the cycle, but on account of the relatively small capacity or cubic feet per minute handled by the apparatus which employed cylinders I was unable to obtain a capacity result in terms of the cost of the apparatus. This work was covered by patents which have long since been open property and has recently been developed using turbo structure by the Westinghouse Mfg. Co.

At this time I was very much interested in internal combustion cycles and I made a contract with the General Motors Co. to develop a rotary valve engine, as the cast iron valves of that day did not have the life and stamina that they since have attained due to the metallurgical art in poppet-valve steel. This contract led me to Detroit in the Cadillac plant where several engines under my patent were built and operated and it was during this time that I started to build the first domestic refrigerating unit which I built in the Colton Pharmaceutical plant on the corner of Chene St. and Jefferson Ave.

The first machine I built was an ammonia absorption machine, using a gas flame with the idea of using the wasted reflected heat from the gas burners in a gas range to produce refrigeration in the home.

In my next machine I turned to the compression sulphur-dioxide cycle using the expansion valve between my high-pressure and low-pressure sides.

Historic Barroom Party

At this time, which was in 1912, I met through some friends at the old Ponchartrain Bar, Mr. Edmund J. Copeland, who was then Purchasing Agent for the Buick Motor Car Co. in Flint and who knew no more about refrigeration than a cow does of the solar system, but Mr. Copeland became interested in the possibilities of my proposition after seeing my first approved sulphur-dioxide machine and he introduced me to a Mr. Arnold H. Goss, who at that time had a small plant building spare tire supports for the rear of the automobile.

We formed a small company incorporating ourselves as the three incorporators to continue this development and through this association with these two men the Kelvinator Corporation was formed, each of us having a one-third stock interest.

Due to financial stringency I put up my one-third interest as collateral on a loan from Mr. Goss and Mr. Copeland and through disagreeable circumstances, which I will not further speak about, I lost my one-third interest in the Kelvinator Corporation.

As far as conception and technical knowledge and the ability to see the future of domestic refrigeration I was the sole starting main-spring of the Kelvinator company.

I remember in my endeavor to obtain money to continue my refrigerating development before I met Mr. Copeland that I had an interview with a very prominent banker in Detroit, who, after I had shown him my tests and pictures of my machine, turned to me and said, "What, Mr. Wales, do you plan to put a whole machine shop into a kitchen to make a few cubes of ice?" This seems to me the attitude of the monied interests at that time towards the projected field of domestic refrigeration.

In view of this "inertia" I had to associate myself with types of men who did not qualify to my way of thinking in projecting such a development.

It is inconceivable at this time, considering the highly developed refrigeration accessory industry, that at that time I had to build my own thermostats, I had to import from Germany my sulphur-dioxide and I had great difficulty in obtaining proper small, silent operating motors. The noise incident to the early machines was such that we could only see an immediate solution of the noise problem by separating the compressor from the vaporizing element and placing the motor driven compressor in the basement to "hide away" the noise factor.

It is interesting to check over my engineering notes at that time and in my endeavor to simplify the compressor I had laid out on paper the virtual replica of the well-known "Meter-Miser" of the Frigidaire, but I was unable to obtain satisfactory results due to the undeveloped state of metallurgy and the high accuracy of machine work necessary to satisfactorily build this design.

Inventors Still Need Commercial Contacts

It would be a most valuable step in engineering development in this country if an organization was set up to which inventors and engineers could come to and which organization had as its keynote of organization the open mind necessary to evaluate new projects on a real merit and through this organization commercial contacts could be obtained.

I have right now basic developments in the air conditioning and heating art without knowing just what concerns would or would not be interested and it is a very poor maneuver to go indiscriminately from organization to organization and "hawk" your wares.

Trusting that I may have the pleasure of chatting with you at some time when I may be in Detroit and appreciating the spirit in which your letter was written, I am

Cordially yours,
NATHANIEL B. WALES

Commercial Service

Service Methods on Soda Fountains With Instantaneous Water Coolers (Concl.)

By Arch Black and Dean C. Seitz

(E) Complaint—Suction Line Frost Outside Creamer Unit

1. EXPANSION VALVE OPEN TOO WIDE

a. Ice cream refrigeration circuit.

If the ice cream refrigeration circuit thermostatic expansion valve has been open too wide, too much refrigerant will spill into the suction line, producing a hard frost on the line outside the unit. The remedy is to throttle (turn counter-clockwise) the adjustment on the thermostatic expansion valve very slowly, ⅛ revolution at a time, until the frost lines back into the heat interchanger.

b. Jar enclosure refrigeration circuit.

If the ⅜-inch suction line leading from the jar enclosure and bottle storage compartment is frosted outside the cabinet, the thermostatic expansion valve controlling this circuit should be throttled until the frost line moves back to the bulb location. The bulb is located on the bottom turn of the refrigeration coil located on the top wall of the bottle storage compartment.

c. Instantaneous water cooler refrigeration circuit.

If the thermostatic expansion valve controlling the refrigerant supplied through the instantaneous water cooler is opened too wide, frost will appear on the suction line outside the creamer unit beyond the point at which the suction line leaves the LTV-20 valve.

The remedy is to throttle the adjustment of the expansion valve until the frost line disappears at the LTV-20 valve. This adjustment should be made with the condensing unit operating and normal amounts of water drawn from the draught arm.

2. EXPANSION VALVE THERMAL BULB NOT IN ITS WELL

The ice cream refrigeration circuit expansion valve must be located in the well provided for it. If it is not pointed down to the bottom of the well, this operation should be performed by the installation or service engineer. The thermostatic expansion valve controlling the jar enclosure and bottle storage refrigeration must be clamped securely in position on the bottom turn of the refrigeration coil located on the front wall of the bottle storage compartment.

If the thermal bulb of the expansion valve controlling the instantaneous water cooler is not inserted in the well provided for it on the inner shell of the water cooler, the valve will remain open and flood the instantaneous cooler. The remedy is to place the valve in its well. Do not forget to replace the rubber stopper over the opening of the well. Do not fill this well with oil.

3. DIRT IN THE EXPANSION VALVE

To replace a thermostatic expansion valve, the refrigerant must be pumped out of the expansion coil before breaking into the line. Since it is unnecessary to pump down the instantaneous water cooler if the ice cream thermostatic expansion valve must be changed, the service engineer may close the liquid and suction line valves of the instantaneous water cooler circuit when pumping down the ice cream refrigeration coil.

To pump down the ice cream and jar refrigeration coils, close the main liquid line valve at the condensing unit and block in the condensing unit switch in order to force the unit to operate. This procedure will pump down both the ice cream refrigeration coil and the jar enclosure refrigeration coil in approximately one hour.

Before breaking into the refrigeration line to replace the expansion valve, the pressure on the low side should be raised to a fraction above atmospheric by cracking the main liquid line for a few seconds. This operation will prevent any air from entering the system.

To pump down the instantaneous cooler, close the water cooler liquid line valve and then open the draught arm, permitting water to run continuously. This will pump down the instantaneous water cooler and the jar enclosure in approximately 15 minutes. After the instantaneous water cooler has been emptied of refrigerant, close the water cooler suction line valve. When the line is cracked open, there will be a rush of gas which is merely the release of the 32-lb. pressure held inside the cooler by the LTV-20 valve.

4. CHECK VALVE LEAK

If the check valve leaks badly, warm refrigerant gas from the water cooler or from the jar enclosure expansion valve will be condensed in the colder ice cream expansion coil. Never change a check valve until all the other remedies of a frosted suction line have been tried without success. The correction is to replace the check valve or to clean out the dirt which is holding it open.

5. VERY WARM INLET WATER THROUGH THE INSTANTANEOUS WATER COOLER

If very warm water (such as 90 to 100°) enters the instantaneous cooler, violent boiling will take place and some of the liquid refrigerant will enter the suction line. The service engineer should make certain that the hot and cold water lines in the building have not been reversed in making his connections. It is also possible that a check valve in the hot water line is leaking.

(F) Complaint—Condensing Unit Short Cycles

Whenever either city water or soda water are drawn from the draught arms, the condensing unit will normally be operating on relatively short cycles. Short cycling becomes a service complaint only when it occurs every few seconds or continues whether or not water is being drawn.

1. SURGE TANK VALVE NOT OPEN

When the surge tank shut-off valve is not open, extremely short cycles will occur. The obvious remedy is to open the surge tank valve.

2. SHORTAGE OF REFRIGERANT

Shortage of refrigerant can be determined most easily by the use of a liquid line sight gauge. The remedy is to add refrigerant until the sight gauge no longer "flashes."

3. CONDENSING UNIT SWITCH (LOW PRESSURE) CUTS IN TOO LOW

The condensing unit will short cycle if the cut-in point of the low pressure switch is set too low for the gauge to obtain the actual cut-in point. The recommended setting has been given in a previous article.

4. DRAUGHT ARM LEAK

A leakage of water from either the city water or soda water draught arm will start and stop the condensing unit on extremely short cycles. The remedy is to correct the leaky draught arm.

5. HIGH-PRESSURE CUT-OUT

The high pressure switch on the condensing unit may be starting and stopping the unit. The remedy is to locate and correct the source of the high pressure.

6. LEAKY EXHAUST VALVE

If the exhaust valve of the condensing unit leaks, the high side pressure will leak into the crankcase causing the condensing unit to short cycle. The remedy is to replace the leaky exhaust valve.

(G) Complaint—Jar Enclosure And Bottle Storage Too Warm

1. EXPANSION VALVE NOT OPEN SUFFICIENTLY

If not enough refrigerant is entering the jar enclosure expansion coil, both the bottle storage compartment and the jar enclosure will be too warm. The remedy is to open the expansion valve slowly, ⅛ revolution at a time, until the frost line moves to the location of the thermal bulb.

2. MOISTURE IN THE SYSTEM

This point has been previously discussed. See point 3 of complaint C entitled "Ice cream too soft."

3. SHORTAGE OF REFRIGERANT

This point has been previously discussed. See point 4 of complaint C entitled "Ice cream too soft."

4. LIQUID LINE VALVE SHUT

The liquid line valve located on the jar enclosure circuit may have been used by the customer for defrosting. He should be cautioned to open it each time the jar enclosure is defrosted.

(H) Complaint—Jar Enclosure or Bottle Storage Too Cold

1. EXPANSION VALVE OPEN TOO WIDE

Inspect the jar enclosure and bottle storage refrigeration coil in order to locate the point at which the frost line stops. The expansion valve should be throttled until the frost line just touches the bulb.

2. CUT-OUT POINT OF CONDENSING UNIT SWITCH TOO LOW

If the cut-out point of the condensing unit switch is set too low, the jar enclosure will be too cold. Since there is not a temperature control valve, or pressure control valve in the suction line leading from the jar enclosure, its temperature is primarily controlled by the cut-out point of the condensing unit. Since the cut-out point of the condensing unit is controlled by the temperature control, it is never advisable to adjust the control to obtain the desired temperature in the jar enclosure.

The proper method of obtaining this temperature is by adjusting the thermostatic expansion valve to give the desired frost line. In other words, the proper temperature adjustment in the suction line is obtained by varying the amount of refrigeration coil by either adjusting the expansion valve or by moving the location of the bulb of the thermostatic expansion valve.

3. CONDENSING UNIT SWITCH STUCK

If the condensing unit runs continuously, the jar enclosure will freeze. The remedy is to locate and correct the cause of the stuck condensing unit switch.

This instalment concludes the analysis of service complaints and suggested remedies on soda fountains equipped with instantaneous water coolers. Previous articles on this subject appeared in the May 10, May 17, and May 24 issues.

Air Conditioning

Surveys Show Number of Installations By Types of Businesses In Leading Cities

Editor's Note: These surveys, obtained through the cooperation of local power companies, show air-conditioning installations in leading population centers for 1938 and years previous, classified according to types of businesses.

Oklahoma Gas & Electric Territory

(Data Furnished by Oklahoma Gas & Electric Co.)

Classification	Prior to 1937 No.	Prior to 1937 Hp.	During 1937 No.	During 1937 Hp.	During 1938 No.	During 1938 Hp.	Total No.	Total Hp.
Apartment Houses	1	5.75	0	0.0	2	9.85	3	15.6
Apartments	5	9.85	2	5.0	5	5.15	12	20.0
Private Homes	125	230.12	91	212.0	71	187.87	287	629.99
Banks	4	120.25	1	10.0	6	114.75	11	245.0
Billiard Parlors	0	0.0	1	13.0	2	19.5	3	32.5
Church	0	0.0	1	20.0	0	0.0	1	20.0
Film Exchange	0	0.0	1	9.0	0	0.0	1	9.0
Doctors' & Dentists' Offices	11	18.85	7	23.0	11	31.83	29	73.68
Funeral Parlors	3	33.7	0	0.0	2	40.67	5	74.37
Hospitals	6	30.45	2	20.0	3	47.3	11	97.75
Offices	56	320.24	32	147.0	31	143.48	119	610.72
Studios	4	40.96	0	0.0	0	0.0	4	40.96
Utility Company	1	103.8	8	507.0	0	0.0	9	610.8
Barber Shops	2	9.1	2	10.0	4	12.08	8	31.18
Hotel Guest Rooms	0	0.0	5	400.0	4	60.55	9	460.55
Hotel Coffee & Dining Rooms	2	194.5	1	13.0	0	0.0	3	207.5
Office Buildings	2	575.5	1	35.0	0	0.0	3	610.5
Restaurants	13	228.45	6	58.0	11	119.41	30	405.86
Department Stores	3	148.5	3	218.0	1	346.25	7	712.75
Stores	36	521.38	22	281.0	21	456.81	79	1,259.19
Theaters	3	916.5	1	85.0	0	0.0	4	1,001.5
Auditoriums	2	63.5	0	0.0	1	359.0	3	422.5
Civic Building	1	350.0	0	0.0	0	0.0	1	350.0
Schools	1	7.5	1	18.0	0	0.0	2	25.5
Miscellaneous Commercial	2	5.28	0	0.0	0	0.0	2	5.28
Bakeries	1	11.5	0	0.0	0	0.0	1	11.5
Fur Storage	1	5.2	5	24.0	1	7.5	7	17.7
Miscellaneous Industrial	3	16.05	0	0.0	0	0.0	3	16.05
Food Storage	0	0.0	1	2.0	0	0.0	1	2.0
Total	291	3,966.39	194	2,110.0	176	1,962.0	658	8,019.93

Chicago, Ill.

(Data Supplied by Commonwealth Edison Co.)

Classification	Prior to 1937 No.	Prior to 1937 Hp.	During 1937 No.	During 1937 Hp.	During 1938 No.	During 1938 Hp.	Total No.	Total Hp.
Amusements	0	0.0	1	33.0	3	107.0	4	140.0
Banks	12	1,580.0	1	5.0	3	164.0	16	1,749. 0
Barber Shops	3	9.0	1	1.0	0	0.0	4	10.0
Beauty Shops	14	154.0	5	19.0	8	33.0	27	206.0
Brokers	15	882.0	0	0.0	0	0.0	15	882.0
Churches	4	167.0	0	0.0	3	127.0	7	294.0
Civic Buildings	3	716.0	0	0.0	1	30.0	4	746.0
Clubs	6	445.0	1	36.0	0	0.0	9	481.0
Dance Halls	4	465.0	0	0.0	0	0.0	4	465.0
Doctors & Dentists	0	0.0	0	0.0	4	19.0	4	19.0
Funeral Parlors	31	332.0	15	245.0	20	173.0	66	750.0
Hospitals	6	82.0	0	0.0	2	7.0	8	89.0
Hotels	31	3,617.0	1	1,077.0	3	44.0	35	4,738.0
Industrial								
Bakeries	20	354.0	1	4.0	1	15.0	22	373.0
Candy	39	4,240.0	5	177.0	2	23.0	46	4,440.0
Printing	26	2,264.0	6	462.0	2	46.0	34	2,772.0
Miscellaneous	35	1,330.0	7	635.0	4	111.0	46	2,238.0
General Offices & Bldgs.	140	8,774.0	62	4,294.0	56	872.0	258	13,895.0
Private Offices	87	241.0	6	14.0	6	20.0	99	275.0
Residences	30	115.0	13	40.0	9	38.0	52	194.0
Restaurants	201	5,028.0	102	1,907.0	88	1,382.0	390	8,317.0
Stores								
Candy	30	104.0	7	28.0	13	68.0	50	201.0
Clothing, Dept.	44	3,023.0	17	441.0	24	446.0	85	3,910.0
Drug	34	481.0	21	187.0	22	221.0	77	889.0
Food	10	431.0	6	44.0	8	32.0	24	508.0
Fur	14	95.0	6	30.0	3	16.0	23	142.0
Shoe	25	258.0	26	341.0	9	65.0	60	665.0
Miscellaneous	32	1,918.0	21	406.0	6	115.0	54	2,439.0
Studios	5	419.0	3	10.0	4	51.0	12	480.0
Theaters	150	20,000.0	35	1,915.0	10	636.0	195	22,551.0
Total	1,045	57,691.0	371	12,306.0	314	4,861.0	1,730	74,858.0
Room Coolers	304	301.0	199	242.0	363	269.0	866	812.0

Newark, N. J.

(Data Supplied by Public Service Electric & Gas Co.)

Classification	Prior to 1937 No.	Prior to 1937 Hp.	During 1937 No.	During 1937 Hp.	During 1938 No.	During 1938 Hp.	Total No.	Total Hp.
Residences	52	126.8	20	59.2	13	31.1	85	217.1
Private Offices	46	359.2	35	334.8	46	364.8	127	1,058.8
Restaurants	42	733.6	26	393.4	25	449.4	93	1,576.4
Retail Stores	57	888.1	51	756.8	69	668.8	177	2,313.7
Offices	9	128.3	0	0.0	0	0.0	9	128.3
Banks	9	541.7	4	116.2	0	0.0	13	657.9
Funeral Homes	11	87.8	8	48.6	10	97.3	29	233.7
Beauty Parlors	3	16.2	12	345.1	6	35.3	21	396.6
Theaters	18	3,907.0	3	188.5	3	210.5	24	4,306.0
Hospitals	2	122.0	1	27.2	2	8.5	5	157.7
Miscellaneous	0	0.0	4	311.0	7	568.8	11	879.8
Tap Rooms & Bars	0	0.0	0	0.0	6	40.8	6	40.8
Total	249	6,910.7	164	2,580.8	187	2,475.3	600	11,966.8

Jackson, Miss.

(Data Supplied by Mississippi Light & Power Co.)

Classification	Prior to 1937 No.	Prior to 1937 Hp.	During 1937 No.	During 1937 Hp.	During 1938 No.	During 1938 Hp.	Total No.	Total Hp.
Residential	22	25.5	16	27.75	3	3.5	41	51.75
Commercial	56	305.5	35	344.6	33	533.5	124	1,183.6
Industrial	2	6.5	0	0.0	1	10.0	3	16.5
Total	80	337.5	51	372.35	37	547.0	167	1,256.6

9 Directors Elected To Board By Members Of N. R. D. G. A.

NEW YORK CITY—Nine new directors have been elected by mail ballot to the board of directors of the merchandising division of National Retail Dry Goods Association.

The new directors-at-large are: R. H. Dee, Denver Dry Goods Co., Denver; George W. Johns, Scruggs, Vandervoort & Barney, St. Louis; Thomas MacLeod, Stern Bros., New York City; (all elected for three years).

J. Sylvan Kaufman, Mandel Brothers, Chicago; W. B. Pirtle, Stewart Dry Goods Co., Louisville, Ky.; B. L. Strauss, The May Co., Los Angeles; (all elected for two years).

L. B. Howland, Forbes & Wallace, Springfield, Mass.; Ira W. Pyron, D. H. Holmes Co., Ltd., New Orleans; Benjamin M. Weiss, Dey Brothers, Syracuse, N. Y.; (all elected for one year).

Revere Appoints Kuthe Technical Advisor

DETROIT—C. H. Kuthe has been appointed technical advisor to the Michigan division of Revere Copper & Brass, Inc. He will work directly with Charles W. Thomas, vice president and general manager, and W. W. Roach, industrial sales manager, of the division, with headquarters here.

Mr. Kuthe, after graduating from the Case School of Applied Science, Cleveland, became associated with the steel and tubes division of Timken Roller Bearing Co. as engineer engaged in the development and manufacture of steel tubing and alloy steels. Later he occupied a sales and sales engineering post for the Timken company in the Philadelphia district.

New Fan & Mica Standards Published By Nema

NEW YORK CITY—New standards for fans and for manufactured electrical mica have been published by National Electrical Manufacturers Association.

Fan standards (Publication No. 39-56) cover desk and bracket, ceiling, ventilating, and air-circulator types, and include information on ratings, performance requirements, general guarantees, and manufacturing practice. Copies of this publication may be obtained from Nema headquarters at 10 cents each.

The mica standards (Publication No. 39-55, superseding publication No. 33-18 printed in 1933) may be obtained from Nema at 25 cents per copy.

Theobald To Represent 3 Manufacturers

CLEVELAND—Carl J. Theobald, who has been associated with appliance merchandising for the past 15 years, recently opened offices at 1105 Chester Ave. as a manufacturer's representative for Detrola radios and candid cameras, Electromaster ranges, and Pittsburgh water heaters.

New C.I.T. Offices Opened

NEW YORK CITY—Three new branch offices have been opened by C.I.T. Corp. One is in Batavia, N. Y., with F. B. Weber as manager, another in Waterbury, Conn., with H. A. Delvy as manager, and the third in Columbus, Ga., with J. B. McGrath as manager.

CLASSIFIED ADVERTISING

RATES: Fifty words or less in 6-point light-face type only, one insertion, $2.00, additional words, four cents each. Three consecutive insertions $5.00, additional words ten cents each.

PAYMENT in advance is required for advertising in this column.

REPLIES to advertisements with Box No. should be addressed to Air Conditioning & Refrigeration News, 5229 Cass Ave., Detroit, Mich.

POSITIONS WANTED

REFRIGERATION SERVICEMAN desires position in western part of country, but would consider anything. Am 25 years old, married, taken trade school training, have 3½ years' service experience and am now connected with Frigidaire organization. Salary secondary. Box 1151, Air Conditioning & Refrigeration News.

FRANCHISES AVAILABLE

COMMERCIAL LINE refrigerator display cases, walk-in coolers, and refrigerators; also direct draw, mechanically-cooled beer coolers. Sell with Ehrlich compressors or with any other make. Attractive discounts, also financing arrangements to help sell. 70 years in business. Write for full information. EHRLICH REFRIGERATOR MFG. CO., St. Joseph, Mo.

EQUIPMENT FOR SALE

R & S PARTS COMPANY opens field to independent service men and former Grunow dealers. Purchase your Grunow parts direct. At reasonable prices. Refrigerant CH_3-CL_2, gallon—$4.00, compressors exchange—$11.00, Carrene meters exchange—$3.00, compressor oil per gallon—$1.75. Many other items not listed. 3577 Fourteenth Street, Detroit, Michigan.

REPAIR SERVICE

DOMESTIC CONTROLS repaired: Ranco pencil $1.75, Ranco box $2.00, General Electric $2.00, Tag $2.00, Cutler-Hammer $2.00, Penn $2.00, Bishop Babcock $2.50, Majestic $2.50, Penn magnetic $2.50, G. E. Frigidaire $2.50. In business over 20 years. Our name is our guarantee. UNITED SPEEDOMETER REPAIR CO., INC., 342 West 70th Street, New York City.

CONTROL REPAIR service. Your controls repaired by expert mechanics, with special precision equipment. Supervised by graduate engineers. We stress perfection and dependability before price. One year guarantee on domestic controls. Any bellows operated device repaired. HALECTRIC LABORATORY, 1793 Lakeview Road, Cleveland, Ohio.

MAJESTIC, GRUNOW, General Electric and Westinghouse rebuilding. World's largest rebuilders. Prices $30.00 with 18 months' guaranty. Parts for Majestics and Grunows. GE floats $2.95. Westinghouse flapper valves $1.00. ⅙ H.P. Majestic capacitor motors $3.75. Write for catalog. G & G GENUINE MAJESTIC REFRIGERATOR AND RADIO PARTS SERVICE, 5801 Dickens, Chicago.

PATENTS

HAVE YOUR patent work done by a specialist. I have had more than 25 years' experience in refrigeration engineering. Prompt searches and reports. Reasonable fees. H. R. VAN DEVENTER (ASRE), Patent Attorney, 342 Madison Avenue, New York City.

Where Air Conditioning Was Installed In Fort Worth, Tex. During 1938

(Data Supplied by Community Public Service Co.)

Name	Make of Equipment	Hp.	Tons
Offices			
Baker Ice Machine Co. (storage)	Baker	8.0	10.0*
Electric Building and Annex	Carrier	633.75	450.0
Merchants Fast Motor Lines	Frigidaire	6.5	5.0
Sinclair Building	Carrier	161.41	100.0
Reynolds Building	Airtemp	111.42	90.0
Coca Cola Bottling Co.	York	6.5	5.0
Stafford-Lowdon	Frigidaire	0.8	0.75
Tarrant County Bldg. & Loan	Carrier	15.0	10.0
Stores & Sales Floors			
The Fair Store	York	375.0	250.0*
Jackson's	Frigidaire	22.0	15.0*
Lerner Stores, Inc.	Westinghouse	10.67	9.0
Bond Stores Corp.	Carrier	38.91	30.0
W. C. Stripling Co.	Carrier	855.0	600.0
Stonestreet & Davis	Frigidaire	20.0	15.0
A. Davis Co.	Frigidaire	20.0	15.0
McCrory Stores Corp.	Airtemp	131.83	100.0
Monnig Dry Goods Co.	Carrier	27.16	20.0
Levy Bros.	Cool-Aire	1.05	1.0
Restaurants			
W. C. Stripling Co.	Baker	28.0	20.0*
Worth Cafe	Airtemp	12.5	10.0
Delta Cafe	Westinghouse	5.5	3.5
French Italian Restaurant	Airtemp	4.08	3.0
Knickerbocker Buffet	Westinghouse	25.0	20.0
Wayside Inn	Baker	46.5	40.0
Drug Stores			
Renfro Drug Co. No. 10	Westinghouse	13.0	10.0
Bank			
Fort Worth National Bank	Frick	243.0	150.0
Hospital Operating Room			
U. S. Public Health Service	Frigidaire	42.0	30.0
Hospital Room			
All Saints	Frigidaire	0.8	0.75
Beauty Shop			
Canary Beauty Shop	Mills	5.75	5.0
Radio Studios			
KGKO (Medical Arts Bldg.)	Frigidaire	12.5	10.0
Texas State Network	Baker	20.0	15.0
Hotels			
Blackstone Hotel	Baker	386.5	250.0
Residences			
Robert D. Goodrich	Frigidaire	10.58	7.5
Marvin Leonard	Frigidaire	9.5	7.5
B. G. Rhodes	Westinghouse	3.0	2.5
C. L. Rowan	Airtemp	3.33	3.0
A. H. Rowan	Airtemp	3.33	3.0
F. Kirk Johnson	Frigidaire	1.6	1.5
E. D. Landreth	Frigidaire	0.8	0.75
R. Houston Foster	Frigidaire	1.6	1.5
C. C. Cartwright	Frigidaire	0.8	0.75
Ted Elstrand	Frigidaire	0.8	0.75
Amon G. Carter	Frigidaire	1.6	1.5
Van Zandt Smith	Frigidaire	0.8	0.75
Dr. Goldberg	Frigidaire	0.8	0.75
W. C. Forbess	Frigidaire	0.8	0.75
Mrs. B. S. Walker	Frigidaire	1.6	1.5
Horace Durstan	Airtemp	3.33	3.0

*Supplementary equipment added during 1938. Figure represents total system.

Air-Conditioning Installations Made In Memphis, Tenn. During 1938

(Privately Compiled—Incomplete—Room Coolers Not Included)

Name	Installation	Hp.
Anderson Clayton Co.	Carrier	15
Bemis Bag Co.	Frigidaire	7½
Britling's Cafeteria	Airtemp	40
Carson's Sandwich Shop	Airtemp	5
Charm Shop	Airtemp	3
Chamber of Commerce	Frigidaire	10
Collins Funeral Home	Frigidaire	3
Dailey's Clothing Store	General Electric	5
Donaldson & Poston	General Electric	3
Exchange Building	Frigidaire	60
Golf Shaft & Block Co.	Frigidaire	3
Grace Ann Beauty Shop	Airtemp	5
Jenkens Cafeteria	Airtemp	10
Lewis Clothing Co.	Frigidaire	9
Log Cabin Restaurant	Frigidaire	7½
Nichols Beauty Salon	Airtemp	5
Pantage Drug Co. No. 1	Frigidaire	5
Pantage Drug Co. No. 2	Frigidaire	7½
Park Restaurant	General Electric	6
Dr. W. H. Pistole	Frigidaire	3
John P. Robillo (Restaurant)	Airtemp	15
Telephone Co.	Frigidaire	10
Swindells Beauty Shop	Frigidaire	3
Walgreen Co.	Frigidaire	15
Wener's Bootery	Frigidaire	3
William's Beauty Shop	Carrier	5
Wolf's Men's Shop	Frigidaire	5
Dr. C. J. Justis	Frigidaire	3
Mary Gay Candy Shop	Airtemp	3
Firestone Tire & Rubber Co.	York	40
Total		335½

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Careful buying requires that you weigh initial cost against the standard of performance you may expect from what you purchase. Price is of course important, but equally important is functional efficiency.

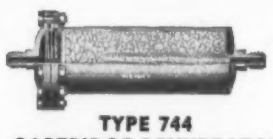
Henry, however, passes both these tests with flying colors. Henry products are competitively priced, and lead the field in advanced engineering design, exclusive features of construction, and range of size and type. Products of a quarter of a century of manufacturing experience, their widespread trade acceptance is proof of their superiority.

Moreover, when you buy a Henry product you are getting more than mechanical utility. Henry gives you better operation and insures you against expensive "call backs." Ask any man who has experience in the specification, buying or installing of Henry products for refrigeration or air conditioning—he'll tell you they really cost you less.

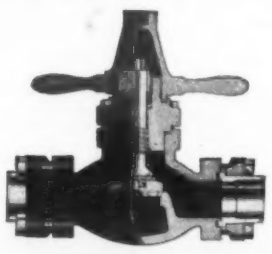
HENRY VALVE COMPANY

1001-19 NO. SPAULDING AVENUE • CHICAGO, ILLINOIS

TYPE 895 "Y" STRAINER
For Copper pipe.
An exceptional design.



TYPE 744 CARTRIDGE DEHYDRATOR
Easy to refill with new dehydrant cartridge.



WING CAP VALVES DESIGNED ESPECIALLY FOR FREON AND METHYL CHLORIDE
Nominal Sizes ½" to 4"

TYPE 709 DEHYDRATOR
For small refrigeration units.

TYPE 882 STRAINER—With Felt Sack
Inexpensive. Screw Cap. Easy to Clean.

Most Complete
LINE OF DRYERS, STRAINERS AND LARGE LINE VALVES FOR REFRIGERATION AND AIR CONDITIONING—ALSO AMMONIA VALVES AND FORGED STEEL FITTINGS

HENRY VALVE CO TRADE MARK

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Catalog 84—Dryers, Strainers and Large Line Valves for Freon, Methyl Chloride and Sulphur Dioxide.

Catalog 53—Ammonia Valves and Forged Steel Fittings.

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†Chicago, Ill.	H. W. Blythe Co.
†Chicago, Ill.	H. Channon Co.
†Chicago, Ill.	Fred C. Kramer Co.
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†Cleveland, Ohio	Williams & Co., Inc.
†Columbia, S. C.	Henry V. Dick & Co.
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Des Moines, Iowa	Iowa Radio Corp.
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†Kansas City, Mo.	Forslund Pump & Mach. Co.
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†Madison, Wis.	Refrig. Specialty Co.
†Memphis, Tenn.	United Refrig. Sup. Co.
†Miami, Fla.	Jamita Co.
Milwaukee, Wis.	Gustav A. Larsen Co.
†Milwaukee, Wis.	Refrig. Specialty Co.
†Milwaukee, Wis.	Thermal Co., Inc.
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†Minneapolis, Minn.	Vincent Brass & Copper Co.
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†Sioux City, Ia.	Dennis Refrig. Supply
†South Bend, Ind.	F. H. Langsenkamp Co.
†Springfield, Ill.	Springfield Refrig. Sup. Co.
Springfield, Ill.	U. S. Electric Co.
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Toronto, Ont.	Railway & Eng. Specialties, Ltd.
Troy, N. Y.	Aird-Don Co.
†Tulsa, Okla.	Machine Tool & Sup. Co.
Vancouver, B. C.	Fleck Bros., Ltd.
Washington, D. C.	Refrig. Sup. Co.
Wichita Falls, Tex.	United Elect. Serv. Co.
Wilkes-Barre, Pa.	Radio Service Co.
Winnipeg, Man.	Railway & Eng. Specialties, Ltd.
Winnipeg, Man.	Winnipeg Refrig. Parts
†Worcester, Mass.	Standard Sup., Inc.

(†Also stock ammonia valves and fittings)

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